PB87-188827

Superfund Record of Decision (EPA Region 2)
Price Landfill, Egg Harbor Township and
Pleasantville, Atlantic County, New Jersey
September 1986 (Second Remedial Action)

(U.S.) Environmental Protection Agency
Washington, DC

29 Sep 86

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Superfund Record of Decision:

Price Landfill, NJ (Second Remedial Action)

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16. ABSTRACT

Price Landfill (also known as "Price's Landfill Number One" and "Price's Pit") is a 26-acre site located in Egg Harbor Township and Pleasantville City, Atlantic County, NJ approximately six miles northwest of Atlantic City, NJ. The relatively flat site is located within the 11,600-acre watershed of Absecon Creek. Land use in the immediate area consists of residential properties, small business properties, sand and gravel excavations, and undeveloped rural lots. Price landfill was originally a sand and gravel excavation operation owned by Mr. Charles Price, which ceased operating in 1968 when the pit was excavated to within approximately two feet of the water table. In 1969, the facility became a commercial solid waste landfill and in May 1971, began accepting a combination of both drummed and bulk liquid waste. Some liquid wastes were poured directly into the landfill from open tank truck spigots. Other waste was buried in 55-gallon drums, some of which were punctured or opened prior to disposal. An estimated 9.1 million gallons of chemical wastes were disposed of at the site. In 1980, residential wells in the area were found to be contaminated with volatile organic compounds, and the Atlantic County Health Department recommended that their use as a potable water supply be discontinued. As an interim measure, potable water was provided from tank trucks and, in December 1981, 37 affected residents were connected to the New Jersey Water Company (NJWC) System. During the summer of 1982, EPA and the State of NJ (See Attached Sheet)

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16. ABSTRACT (continued)

implemented initial remedial measures to assure against the contaminant plume reaching the Atlantic County Municipal Utilities Authority (ACMUA) public water supply wellfield. These measures included the construction of an interconnection with the NJWC system, redevelopment of three ACMUA production wells, installation of granular activated carbon filtration units, and implementation of a water conservation program. In September 1983 EPA issued a Record of Decision based on the results of a 1982 RI/FS. The selected option included: abandonment of the ACMUA existing upper and lower Cohansey aquifer water supply wellfield; relocation and replacement of the ACMUA wellfield and transmission facilities to provide a 13.5 million gallon per day capacity; consideration, in addition to the wellfield relocation, of plume management, source control, and ground water treatment alternatives. EPA began negotiations in 1984 with identified potentially responsible parties. Meetings and court appearances were held with EPA, New Jersey Department of Environmental Protection, and the potentially responsible parties, resulting in a tentative $17.15 million cash settlement for past and future costs. The primary contaminants of concern include: VOCs, organics, inorganics, and TCE.

The selected remedial action includes: installation of a security fence around the landfill site; installation of ground water extraction wells adjacent to the landfill to control the contaminant source; installation of ground water extraction wells hydraulically downgradient from the landfill to abate the contaminant plume; construction of a ground water/leachate pretreatment facility at or near the site; construction of a force main to the ACMUA interceptor system; extraction of contaminated ground water, followed by pretreatment, and ultimate disposal and treatment at the ACMUA waste water treatment plant; quarterly monitoring of ground water quality for approximately 25 years; construction of a landfill cap at the conclusion of the ground water extraction process. The estimated capital cost is $9,050,000 with annual O&M for years 1-5 of $1,010,000 and $255,000 for years 6-25.

RECORD OF DECISION

REMEDIAL ALTERNATIVE SELECTION

Site Price Landfill, Egg Harbor Township and Pleasantville,
Atlantic County, New Jersey

Documents Reviewed

I am basing my decision primarily on the following documents, which describe the analysis of cost-effectiveness of remedial alternatives for the Price Landfill site:

- Remedial Investigation and Feasibility Study for Price Landfill, Camp Dresser and McKee, February 1985;

- Evaluation of Long-Term Remedial Action Alternatives, Price Landfill, Camp Dresser and McKee, April 1983;

- Staff summaries and recommendations;

- Responsiveness Summary, September 1986;

- Documents prepared and transmitted to the U.S. Environmental Protection Agency and the New Jersey Department of Environmental Protection by potentially responsible parties, and governmental responses to them.

Description of Selected Remedy

- Installation of a security fence around the landfill site;

- Installation of groundwater extraction wells adjacent to the landfill to control the contaminant source;

- Installation of groundwater extraction wells hydraulically downgradient from landfill to abate the contaminant plume;

- Construction of a groundwater/leachate pretreatment facility at or near the site;

- Construction of a force main to the Atlantic County Utilities Authority (ACUA) interceptor system;

- Extraction of contaminated groundwater, followed by pretreatment, and ultimate disposal and treatment at the ACUA wastewater treatment plant;

- Quarterly monitoring of groundwater quality for approximately twenty-five years;

- Construction of a landfill cap at the conclusion of the groundwater extraction process.

Declarations

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300), I have determined that the groundwater extraction and treatment remedial action at the Price Landfill site is a cost-effective remedy and provides adequate protection of public health, welfare, and the environment. The State of New Jersey has been consulted and agrees with the selected remedy.

In addition, this action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy. These activities will be considered part of the approved action and eligible for Trust Fund monies for a period of one year. Further, a tentative settlement has been reached between EPA and the potentially responsible parties which includes funding of the remedy with provision for operation and maintenance. I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites.

September 29, 1986
Date

Christopher J. Daggett
Christopher J. Daggett
Regional Administrator

Summary of Remedial Alternative Selection

Price Landfill

SITE LOCATION AND DESCRIPTION

Price Landfill (also known as "Price's Landfill Number One" and "Price's Pit") is a 26-acre site located adjacent to Mill Road in Egg Harbor Township and Pleasantville City, Atlantic County, New Jersey and is approximately six miles northwest of Atlantic City, New Jersey (see Figure 1). The legal description of the site is Block 36A, Lots 3 and 6, of Egg Harbor Township and Block 190, Lot 3, of Pleasantville City.

The relatively flat site is located within the 11,600-acre watershed of Absecon Creek. The major surface waters in the vicinity include the Atlantic City Municipal Utilities Authority (ACMUA) reservoirs, Absecon Creek, and Conover Run. The principal aquifers are the Kirkwood, which begins at approximately 260 feet below the ground surface and is about 600 feet thick near the landfill, and the Cohansey, which unconformably overlies the Kirkwood throughout the area. The Kirkwood aquifer consists mainly of sand, silt and clay, and the Cohansey is primarily unconsolidated sand with some gravel and notable amounts of clay. Both ground and surface waters near the landfill flow in a generally easterly direction, toward the Atlantic Ocean. Land use in the immediate area consists of residential properties, small business properties, sand and gravel excavations, and undeveloped rural lots.

SITE HISTORY

Price Landfill was originally a sand and gravel excavation operation owned by Charles Price, which ceased operating in 1968 when the pit was excavated to within approximately two feet of the water table. In 1969, the facility became a commercial solid waste landfill and in May 1971, began accepting a combination of both drummed and bulk liquid waste. Initial listings of wastes consisted of industrial chemicals, sludges, oil, grease, and septic tank and sewer wastes. Some of the liquid wastes were poured directly into the landfill from open tank truck spigots. Many other wastes were buried in 55-gallon drums, some of which were punctured or opened prior to disposal. It has been estimated that 9.1 million gallons of chemical wastes were disposed of at the site.

In 1980, residential wells in the area were found to be contaminated with volatile organic compounds and the Atlantic County Health Department recommended that their use as a potable water supply be discontinued. As an interim measure, potable water was provided from tank trucks and, in December 1981, thirty-seven affected residences were connected to the New Jersey Water Company (NJWC) system. From January 1982 through May 1983, a remedial

There are two options for the construction of a containment wall at Price Landfill. The first option is a deep wall, keyed into the mid-Cohansey clay at a depth of approximately 150 feet, to control those contaminants which have migrated downward. The second option consists of an intermediate depth, "hanging" wall constructed to a depth of approximately 80 feet. This could effectively provide a barrier to prevent the horizontal distribution of contamination emanating from the landfilled material. Although the hanging wall would not be keyed into any clay layer, it would be placed through a group of clay lenses which are located 50 to 80 feet below the ground surface. In this option, pumping from within the containment wall would be critical, since the clays at the bottom of this intermediate wall are neither thick nor continuous.

The information collected during the field investigation program indicated that the mid-Cohansey clay layer, extending continuously at a depth of about 150 feet below the landfill, cannot be readily identified from field observation based on physical characteristics such as color and texture. Therefore, because of the 150 foot depth of this clay and the difficulty in identifying it, it may not be possible to structurally tie the deep wall into the impermeable formation which would be necessary to lend integrity to the containment wall system. Additionally, with a deep wall design, it becomes necessary to extract groundwater from multiple elevations in order to maintain the desired inward hydraulic gradients. Pumping would be required from both above and below the intermediate clay lenses noted above. Simultaneous pumping from these locations would serve to complicate the remedial design and possibly compromise its effectiveness.

It should be noted that the proposed 150 foot deep wall would also require the application of a clam shell crane bucket to excavate the trench for the containment wall. This construction procedure is much more time consuming than the normal installation (for shallow walls) using traditional backhoe equipment. Operating at these extreme depths may not be technically feasible and might result in the installation of an inferior containment system. The application of vibratory beam technology may be appropriate, but again, the extreme depths dictate against selection of the deep wall.

Finally, although costs are not explicitly considered in this phase of analysis, they would be expected to rise disproportionately for the installation of a deep wall relative to any projected improvements in source control. Therefore, the 150 foot deep wall was excluded from further consideration.

The 80 foot deep containment wall considered would serve to isolate a major portion of the contaminant source from the adjacent hydrogeologic regime. Some contaminants have already migrated vertically below the landfill site, but the available data suggest that contaminant concentrations are more representative of groundwater plume quality (1 ppm) than of leachate quality (approximately 50 ppm). Therefore, given the relatively dilute contaminant levels at depths greater than 50 to 80 feet, plus the acknowledgement that contaminants at this level will be captured by the plume abatement system, the 80 foot deep wall could suffice as a source control measure.

The modeled results of this control alternative for both the source and plume are shown in Figures 13 and 14, where the concentrations in layers 3 and 5 at five years are shown. It is noted that, although some of the existing contamination continues to move to the lower reaches of Conover Run, the pumping system would remove the bulk of the present plume within a five year period, and, since the source would be contained within the containment wall, no further pumping outside the wall beyond that time would be required. The exact shut down date should be determined based on the results of groundwater monitoring. The control/extraction pumping within the containment wall would have to continue until all, or effectively all, of the source material is removed.

The extracted groundwater would undergo treatment prior to discharge to either Absecon Creek or the ACUA wastewater treatment plant. Landfill closure and a groundwater monitoring program would also be required. Treatment, closure, and monitoring are discussed later.

Alternative 4 - Containment Wall with Plume Abatement and Flushing

Remedial Alternative 4 consists of the installation of a containment wall and groundwater extraction wells similar to those for Remedial Alternative 3. The flushing provisions of this alternative would involve treating contaminated groundwater, as it is pumped from the extraction wells, and re-injecting part of the treated water into the landfill. The treated water would accelerate the solubilization and transport of contaminants within the confines of the containment wall. Theoretically, the source itself is gradually removed by accelerating the natural process of contaminant transport from the landfill, and collection of the leachate generated.

The modeling simulations of the off-site characteristics of this alternative are the same as those described under Remedial Alternative 3. No separate modeling was performed regarding the flushing of the unsaturated zone within the landfill because, as discussed below, the alternative was removed from further consideration.

The technological feasibility of this system is questionable with regard to the efficacy of the proposed induced flushing plan. For example, a typical municipal landfill has a heterogeneous composition related primarily to the variation in the physical dimensions, bulk density, and degradability of waste materials disposed of. Wastes disposed of at Price Landfill could have included demolition debris, domestic waste, bulk appliances, and other heterogeneous materials. The geophysical investigation conducted prior to drilling indicated anomalous areas of either bulk metal or conductive liquids. This factor, plus the inconsistent nature in which the wastes were compacted and covered, results in nonuniform void spaces within the landfilled materials.

The net effect is that when water (precipitation or artificially injected water) infiltrates into the unsaturated zone, it has a tendency to seek a path of least resistance and, therefore, "short-circuit" through the landfill. This phenomenon results in preferential solubilization in some areas and tends to compromise the effectiveness of an induced flushing system. The nonuniformity cannot be defined adequately enough to estimate the level of reliability of flushing. In addition, to adequately ensure that no contamination would escape from the landfill, pumping would be required both above and below the intermediate clay lenses previously described. Simultaneous pumping from these locations would complicate the remedial design and possibly compromise its effectiveness. Therefore, the induced flushing concept was removed from further consideration based upon issues of technical feasibility.

EXTRACTED GROUNDWATER TREATMENT ALTERNATIVES

Each proposed remedial alternative, with the exception of the no action (minimal action) alternative, included a provision for the on-site treatment of contaminated extracted groundwater prior to its discharge to either the surface waters of Absecon Creek or to the Atlantic County Utilities Authority (ACUA) wastewater treatment plant. The treatment operations and processes could be modified depending on the quantity of flow being treated, the characteristics of the influent flow, and the discharge criteria.

The specifications for groundwater treatment were established during both a 1982 pilot scale physical-chemical treatability study and a 1984 bio-treatability study which assessed the compatability of the Price Landfill groundwater/leachate with the biological processes of the ACUA wastewater treatment plant. The results of these treatability studies indicated that five treatment alternatives exist, based on consideration of flow volumes, contaminant concentrations in the various influent streams, discharge criteria, and the nature of the treatment processes. The individual treatment process alternatives are identified in Table 2.

Physical/Chemical On-Site Treatment

The physical/chemical on-site treatment process is designed to treat the extracted groundwater prior to discharge to Absecon Creek. Individual treatment steps include pH adjustment, air stripping to remove volatile organics, off-gas treatment with a dehumidifier and vapor phase carbon adsorption, and final treatment of the effluent with sand and granular activated carbon (GAC) filtration. The schematic diagram for this system is shown on Figure 15.

A review of Figure 15 and Table 2 indicates that there are several options regarding the distribution of influent to the proposed physical/chemical treatment system. These options arise from a consideration of both the associated remedial alternatives (plume abatement or containment wall with plume abatement) and a decision on whether to air strip the entire quantity of extracted groundwater or only the more concentrated (50 ppm total volatiles), low volume flows.

Air Stripping/Lime Pretreatment

The air stripping/lime pretreatment system is intended to treat the extracted groundwater prior to discharge to the ACUA wastewater treatment plant. The individual unit operations are similar to those for the physical/chemical on-site treatment except that the water effluent from the air stripper would not be passed through the GAC filters prior to the addition of lime. Provisions were made to analyze this treatment process based upon either removing the metals on-site, or passing the flow to ACUA for final lime addition and sludge removal at the treatment plant. The schematic diagram for this treatment alternative is presented in Figure 16. As with the physical/chemical treatment alternatives, extracted groundwater may be distributed so that only the more concentrated flow enters the air stripper.

Lime Pretreatment

The lime pretreatment process was evaluated to address metals removal where extracted groundwater had concentrations of volatiles which were low enough as to not require pretreatment prior to being conveyed to the ACUA wastewater treatment plant. Groundwater would be conveyed to the plant by means of double seal pumps into a force main connector. Low levels of volatiles, coupled with dilution within the force main and at ACUA, would reduce the volatiles to below levels associated with either odors or health risks. Therefore, under this scenario, it would not be necessary to remove volatiles prior to the precipitation of metals. The schematic diagram for this treatment alternative is presented in Figure 17. The two treatment alternatives evaluated for lime pretreatment are based on total flow treatment for either the plume abatement or containment wall with plume abatement remedial alternatives.

COST ANALYSIS OF REMEDIAL AND TREATMENT ALTERNATIVES

A series of cost analyses were performed in the February 1985 RI/FS to compare Remedial Alternatives 2 and 3 and the five groundwater treatment alternatives. For comparative purposes, each remedial alternative was assumed to include a provision for the installation of a cap which would comply with Resource Conservation and Recovery Act (RCRA) requirements. Monitoring costs are based on the quarterly sampling of two upgradient and six downgradient wells with priority pollutant analyses conducted over a 25 year period.

Capital Costs of the Treatment Alternatives

The capital costs for the five groundwater treatment alternatives are presented in Table 3 for the flow conditions specified in Table 2. Under the physical/chemical treatment alternatives, the reduced air stripping costs for partial flow treatment are more than off-set by the increased GAC costs, such that total flow treatment is more capital intensive. For the air stripping/ lime pretreatment alternatives, the elimination of the GAC units from the system design, plus the reduced costs of the building structure and site work, all operate to make the partial flow option less capital intensive than the total flow option. The lime addition pretreatment alternative offers a moderately expensive alternative which does not address the issue of volatiles removal.

Comparisons were also made for the anticipated treatment costs if metals removal were conducted on-site or at the ACUA wastewater treatment facility. The settling of the sludge and subsequent treatment is more cost-effective when conducted at the ACUA facility. Conversations with ACUA personnel indicated that metals precipitation at ACUA is compatible with ACUA's on-going expansion of its sludge handling capabilities.

Annual Operation and Maintenance Costs and Present Worth of Treatment Alternatives

Projections for the annual operation and maintenance costs for the five groundwater treatment alternatives are presented in Table 4. The projections indicate that carbon usage is a major cost element for the physical/chemical treatment system; the other costs for this option are comparable to those for competing treatment options. The ACUA treatment charge for the air stripping/lime pretreatment system effluent, estimated at

$1,066 per million gallons plus charges for Biochemical Oxygen Demand (BOD) and total suspended solids, nearly off-sets the low chemical costs of this treatment system relative to physical/chemical treatment. The lime addition pretreatment costs are comparable to those for the competing systems, however, this alternative would have no effect on the reduction of volatiles.

The total annual operating costs for the individual treatment systems are generally comparable for the conditions where metals precipitation is conducted at the landfill site. However, if the metals can be satisfactorily removed at ACUA as anticipated, then the operating costs may be slightly reduced depending on whether or not the sludge is classified as hazardous.

Table 5 provides cost estimates for situations where the metals are precipitated at the landfill site. In general, the costs for the application of the physical/chemical treatment alternative exceed those for the air stripping/lime pretreatment alternative by approximately $12,000,000, for the partial flow conditions, and about $7,000,000 for the total flow scenario, on a present worth basis. The costs of the lime addition pretreatment alternative are nearly equivalent to those for the air stripping/lime pretreatment alternative.

A present worth analysis was also conducted for the conditions where metals precipitation occurs at the ACUA wastewater treatment facility (Table 6). Under this scenario, the present worth costs range from $11,450,000 for the partial flow option, to $14,090,000 for the total flow option using the air stripping/lime pretreatment alternatives. If the sludge is determined to be non-hazardous, the cost differentials between on-site and ACUA treatment become approximately $500,000.

The above comparisons assumed that each of the treatment systems would be operational for twenty-five years at the pumping rates shown in Table 2. In 1983, the EPA and NJDEP jointly developed criteria to be used in evaluating the remedial action alternatives for Price Landfill. Remediation of the plume (off-site) will be considered complete when the concentration of TVO in the groundwater reaches 10 ppb or less(see discussion in "Consistency With Other Environmental Requirements" section). It is believed that this will occur within five years. Further analysis is described below which examined the effect on the present worth cost of introducing a pumping regimen which discontinues pumping of specific wells after a five year period and maintains other wells as operational for up to twenty-five years.

Capital Costs and Present Worth of Remedial Action Alternatives

The estimates for capital costs and present worth of the remedial action alternatives are presented in Tables 7, 8, and 9 for situations where metals are removed either at the landfill or at the ACUA wastewater treatment facility. The present worth calculations reflect consideration of the operation of individual pumping wells being discontinued after five years depending upon which remedial alternative is implemented. For example, the plume abatement system will initially pump at a rate of 1.3 mgd with 1.1 mgd consisting of low concentration (1 ppm), plume quality water. The plume pumping would cease after an estimated five years, while source control pumping would continue in the highly contaminated (50 ppm) upper aquifer for approximately 20 additional years. The containment wall with plume abatement alternative would initially be pumped at a rate of 1.36 mgd with 1.1 mgd being plume quality water, 0.10 mgd being pumped from the upper aquifer, and 0.16 mgd being pumped from within the containment wall. After five years, the two series of wells located outside the wall (1.2 mgd of total flow) would be shut down, and the wells within the wall would pump for an additional 20 years.

The present worth costs were reviewed for each remedial alternative to examine how they changed with the selection of a groundwater treatment alternative. A comparison of pretreatment alternatives for the plume abatement alternative, indicated that costs ranged from $9,050,000, for the partial flow air stripping/lime pretreatment system with metals removal at ACUA, to $19,530,000, for the partial flow physical/chemical treatment system where the sludge is hazardous and precipitated at the site.

An analysis of the costs for the various treatment alternatives, when applied to the containment wall with plume abatement alternative (Alternative 3), indicated that costs were approximately $8,000,000 less for the partial flow air stripping/lime pretreatment system than the partial flow physical/chemical treatment. Consideration for treating the total flow resulted in cost differences of approximately $5,000,000 between the competing treatment systems.

SUMMARY

The four remedial action alternatives initially considered for implementation were evaluated in a sequential multi-stage screening process. The attributes considered in the screening process were technical feasibility, system costs, a group of non-cost criteria, and other considerations related to the long-term impact of the aquifer contamination on public health and the environment.

The initial screening mechanism was based on technical feasibility. Major factors considered included site-specific physical characteristics (e.g., topography, geology, hydrology), and an understanding of both the type of waste disposed of at the site and the nature of the operations conducted at a typical municipal landfill. The analysis indicated that it may not be technically feasible to construct a deep containment wall as proposed in Remedial Alternative 3. A complicated pumping regime would also be required to maintain the hydraulic gradients necessary to achieve effective source control. For these reasons, an intermediate depth (80-foot) hanging wall was proposed in place of the deep wall.

Remedial Alternative 4 consisted of a containment wall for source control, using both internal and external pumping, with treatment and supplemental source flushing. The concept of induced source flushing was proposed to expedite removal of contaminants from within the unsaturated zone inside the wall. A technical evaluation of the proposed flushing system, however, indicated that the heterogeneous nature of the subsurface materials in a typical municipal landfill could compromise the expected efficiencies regarding source removal. It is highly probably than any water applied to the surface of the landfill would not percolate uniformly through the saturated zone. Rather, there would be a tendency for the flow to "short circuit" through more porous areas. Thus, the flushing action would be minimal in the less porous areas, where significant quantities of waste material may be bound. The concept of induced flushing does provide a viable treatment mechanism for those situations where subsurface conditions are relatively uniform with respect to porosity, however, this is not the case at Price Landfill. For this reason, the induced flushing option was determined to be technically infeasible.

The remedial actions based on the plume abatement alternative and on the containment wall with plume abatement alternative, were each evaluated in conjunction with five possible groundwater treatment systems. Ten individual remedial options were examined, and capital and annual operating costs were developed for comparative purposes. Capital costs for the plume abatement remedial alternative were lower than those for the containment wall with plume abatement alternative, regardless of the groundwater treatment system selected. Operation and maintenance costs were comparable for each treatment system, however, costs would be reduced considerably if the metals were precipitated at the ACUA facility.

Present worth costs (assuming metals are precipitated at ACUA) for the plume abatement remedial alternative, using air stripping/ lime pretreatment, ranged from $9,050,000 to $10,910,000. Comparable costs were $13,960,000 to $15,850,000 for the containment wall with plume abatement alternative. Comparable costs for situations where metals are settled out at the site ranged from $9,860,000 to $11,900,000 for plume abatement, and $14,790,000 to $16,840,000 for the containment wall with plume abatement, assuming the metals sludge is non-hazardous.

The three remaining remedial alternatives were also evaluated in five non-cost categories: 1) implementability - whether the system could be built and be compatible with remedial requirements; 2) performance and 3) reliability - how it would perform over a period of time; 4) environmental effects - what its effect would be on present and future environmental conditions; and 5) safety - whether there were any potential safety deficiencies that could jeopardize operating personnel. A series of 20 individual criteria were developed in the above non-cost categories.

The remedial alternatives were then evaluated and rated on the specific criteria on a (+), (-), (0) basis to determine a relative ranking. The results from the non-cost evaluation indicated that Remedial Alternatives 2 and 3 rank highest with respect to environmental issues, implementability, and performance.

The no action (minimal action) alternative was superior with respect to worker safety. This may be due to an anomaly of the scoring system, where doing nothing clearly involves minimal potential for impacting worker safety. This, however, avoids the issue of mitigating groundwater contamination. The no action (minimal action) alternative takes no aggressive action in that regard and allows the aquifer to deteriorate. Remedial Alternative 2 was judged slightly superior to Alternative 3 in the non-cost categories, while both Alternatives 2 and 3 are superior to the no action (minimal action) alternative.

Modeling simulations of Alternatives 2 and 3 indicated that both the plume abatement and the containment wall with plume abatement alternatives are effective in reducing groundwater contamination and that the deep extraction wells could be shut down after approximately five years.

RECOMMENDED ALTERNATIVE

The National Contingency Plan requires the selection of "... a cost-effective remedial alternative that effectively mitigates and minimizes threats to and provides adequate protection of public health and welfare and the environment." Therefore, the remedial action alternative recommended for implementation at Price Landfill is Remedial Alternative 2, Plume Abatement. The recommended treatment alternative to be applied is the partial flow air stripping/lime pretreatment option, with metals removal at the ACUA wastewater treatment facility, pending ACUA acceptance. A quarterly groundwater monitoring program will also be implemented. The actual sampling locations and parameters will be developed during remedial design. A security fence will be installed around the site to prevent access by unauthorized individuals. Additionally, erosion control measures and a program to monitor potential air emissions will be implemented. The groundwater extraction and treatment remedial actions will be implemented and completed prior to final landfill closure.

The present worth cost of the recommended alternative, as estimated in the February 1985 RI/FS and shown in Table 9, is $9,050,000.

Operation and Maintenance

Operation and Maintenance (O&M) will be required for the recommended remedial action alternative and will include:

- O&M of the groundwater extraction wells
- O&M of the on-site pretreatment treatment facility
- Monitoring of groundwater elevation and quality in the Cohansey aquifer
- Monitoring of potential air emissions from the site
- Maintenance of the landfill closure

The O&M costs have been presented in Table 9 as $1,010,000 for each of the first five years, and $255,000 per year for the remaining 20 years. The total time period for which O&M estimates were presented in Table 9, is 25 years.

Cap Deferral

Deferral of final landfill closure and capping is an integral part of the recommended remedial action alternative at Price Landfill. It is planned that capping will occur following the completion of the groundwater extraction and treatment process. Sufficient technical justification for delaying the cap installation exists.

The contaminant transport modeling effort, which was undertaken to simulate the effectiveness of the proposed remedial alternatives, relied on a representation of the contaminant source and how that source entered the groundwater system. The contaminant source at Price Landfill was represented as entering the groundwater system at the water table from the upper, unsaturated zone where the wastes were originally deposited. The transport mechanism was based on a natural effective recharge rate of 15.7 inches of rain per year, through an uncapped landfill. This resulted in the estimation that the contaminant source would be effectively depleted in approximately 25 years. If capping were to occur prior to, or at the start of, the remedial action, the source itself would remain active for a longer duration, possibly requiring a longer period of pumping. Additionally, since the groundwater extraction wells would be in operation, the water table would be locally depressed, resulting in greater traveling distances for the contaminants through the unsaturated zone.

It should also be noted that, although induced flushing (i.e., through injection wells) was determined to be technically infeasible with regard to cleansing contaminants from all areas of the landfill, it was recognized that some contaminant transport would occur. Natural infiltration of precipitation, through an uncapped landfill, therefore, would enhance the removal of contaminants at no additional cost.

In making the decision to defer capping the landfill, safety and environmental impact were considered. Although previous air monitoring, utilizing field instrumentation, has shown no elevated contaminant concentrations, the site will be secured by a fence to restrict access. In addition, along with the minor regrading of this relatively flat site, a berm and/or other measures will be constructed around the site perimeter to prevent precipitation runoff and off-site soil erosion, and to induce further infiltration until final closure. Final closure will be compatible with appropriate and relevant federal and state requirements. At a future date, EPA, in conjunction with NJDEP, will evaluate then existing data and other relevant information to determine the appropriate design and extent of the cap.

CONSISTENCY WITH OTHER ENVIRONMENTAL REQUIREMENTS

The remedial action alternatives developed for Price Landfill were intended to control the source of contamination and prevent contaminant migration, as well as abate the contaminant plume which has already migrated from the site. As mentioned earlier, in 1983 the EPA and NJDEP jointly established the goal, for reasons specific to the site, that remediation of the plume would be considered complete when the concentration of total volatile organics (TVO) in the groundwater reaches 10 ppb or less. It is estimated that this will occur within five years from the start of pumping. Throughout that period, the groundwater quality will be monitored to evaluate the effectiveness of the pumping plan in achieving the goal of a concentration of 10 ppb or less. If, after achieving TVO concentrations of 10 ppb or less, specific compounds are found at concentrations above applicable drinking water standards, a determination should be made as to the technical feasibility and cost-effectiveness of meeting those standards. If technically feasible, cost-effective, and appropriate, remedial action may continue until specific contaminant concentrations fall below the applicable drinking water standards. If the goal of 10 ppb cannot be achieved, the need for alternate concentration limits (ACLs), as indicated in RCRA Part 264, will also be determined.

The source control wells, which are located adjacent to the landfill, will continue to pump until the site is essentially no longer a source. This is expected to occur within 25 years. As with the plume abatement wells, groundwater quality will be monitored throughout that period and the need for ACLs will be determined.

The recommended alternative also includes the treatment of the extracted groundwater at the ACUA wastewater treatment facility. All appropriate and applicable regulatory requirements for this action will be complied with.

As previously discussed, final site closure will be delayed until after completion of the remedial action. For consistency with RCRA, and as an integral part of the remedial action itself, air and groundwater monitoring, as well as erosion control measures, will be implemented throughout the remedial action period. Final closure will be compatible with applicable federal and state requirements, however, actual design of the cap will be determined upon completion of the groundwater extraction and treatment program.

COMMUNITY RELATIONS

Copies of the RI/FS report were made available to the public on June 4, 1986, and on July 15, 1986, a public meeting was held in the Egg Harbor Township Municipal Building to present the RI/FS findings. A 21 day comment period followed the meeting. No major adverse concerns were raised at the public meeting regarding the proposed remedy; concerns were raised about the regional water supply shortage, health impacts from past contamination, and sanitary sewer capacities. Following the meeting the potentially responsible parties commented in writing regarding the recommended remedial action alternative. Responses to all comments are included in the attached Responsiveness Summary (except where prohibited by Order of U.S. Magistrate Jerome B. Simandle in the District of New Jersey).

ENFORCEMENT HISTORY

December 22, 1980 - The United States filed a lawsuit in the Federal Court, District of New Jersey, seeking injunctive relief pursuant to Section 1431 of the Safe Drinking Water Act, 42 U.S.C. Section 3005, Section 7003 of the Resource Conservation and Recovery Act, 42 U.S.C. Section 6973 and the federal common law of nuisance. The original suit was instituted against the current owners of the Price Landfill and the persons who owned and managed the landfill in the early 1970's when it was in operation. A hearing was held in the spring of 1981 on the government's motion for a preliminary injunction.

March 16, 1981 - The Atlantic City Municipal Utilities Authority (ACMUA) moved to intervene in this case as a plaintiff. ACMUA was given such permission on September 10, 1984.

September 2I, 1981 - The United States filed a second amended complaint adding thirty-five defendants, two days prior to the court's decision on the preliminary injunction issue. The new defendants included individuals and corporations who allegedly generated and/or dumped the hazardous waste at Price Landfill. The amended complaint also added claims under Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. Section 9606, 9607. The court did not consider these counts in its decision on the motion for a preliminary injunction.

September 22, 1981 - Judge Stanley Brotman held that (1) the United States was not entitled to preliminary injunctive relief requiring the past and current landfill owners to fund a study to monitor the extent of the problem posed by leachate emanating from the landfill and to devise a solution to the problem, and (2) the Government was also not entitled to a preliminary order compelling provision of alternate water supply to those homeowners whose wells were contaminated by the leachate, as defendants were no more able than the homeowners or the United States to provide alternate water supply. The federal common law of nuisance count was dismissed. United States v. Price, 523 F. Supp. 1055 (1981).

September 14, 1982 - The government's appeal of the trial court's decision on the motion for preliminary injunctive relief was ruled upon. The Third Circuit Court of Appeals ruled the District Court had not abused its discretion in denying the motion for the preliminary injunction. United States v. Price, 688 F. 2d 204 (1982).

November 17, 1982 - The United States submitted a summary of its evidence against the defendants as directed by the court. A number of generator defendants expressed the desire to move for summary judgment, and Judge Brotman allowed one generator, Hoffman-LaRoche, to make such a motion.

July 28, 1983 - The court denied the summary judgment motion of Hoffman-LaRoche, United States v. Price, 577 F. Supp. 1103 (1983). The court, however, found that there were no costs incurred as defined by Section 107 of CERCLA and dismissed that count without prejudice.

May 31, 1984 - Magistrate Jerome B. Simandle issued a Case Management Order bifurcating the trial between remedies and liability, with remedies to be tried first.

July 2, 1984 - The defendants filed a third-party complaint against about 40 companies and individuals who allegedly used the landfill.

September 14, 1984 - A second Case Management Order and Confidentiality Order was signed by the Magistrate, changing dates and durations from the first Case Management Order and precluding the parties from releasing information about each other's proposed remedy until after settlement discussions were completed.

November 16, 1984 - The plaintiffs in the State court litigation, approximately 200 private well-owners allegedly affected by the Price Landfill, moved to intervene in the federal action. This was later denied.

November 28, 1984 - The State of New Jersey, Department of Environmental Protection, moved to intervene in this matter as a plaintiff. Intervention was granted December 28, 1984 regarding federal claims. State claims were to be considered later in the litigation.

January 30, 1985 - The United States Magistrate issued the Third Case Management Order and Confidentiality Order, which modified the pretrial schedule and continued the prohibition on the public release of documents relating to proposed remedies for the landfill.

May 29, 1986 - The parties filed a "Statement of Intent" (SOI) to be used in resolving the case. In that SOI most defendants and most third-party defendants agreed to raise $17.15 million to be given to government agencies in exchange for a broad release from further liability arising from use of the Price Landfill. In the SOI, the parties agreed to a modification of the Confidentiality Order so that the Draft Remedial Investigation/ Feasibility Study prepared in February, 1985 could be released to the public.

Concentrations in the upper zone of this formation (layer 5) are anticipated to remain at about 50 ppm in the vicinity of the extraction wells along Mill Road. The contaminated zone is intended to be controlled, however, and is not expected to continue to move away from the landfill. These concentrations would remain as long as the landfill continues as a source of contamination.

It is worth noting that small quantities of contamination would seep to Absecon Creek and Conover Run under this alternative. This contamination would come from areas of the plume which have already moved far downgradient of the landfill and are outside the zone to be controlled by the extraction wells. As in the no action (minimal action) alternative, contaminants from both zones of the upper Cohansey aquifer would move toward Absecon Creek and Conover Run under the revised ACMUA pumping conditions. The seepage to the Creek, Run, and adjoining marshes would be at concentrations of less than 10 ppb but would continue throughout the 20-year time period simulated.

The lower zone of the upper Cohansey aquifer should be monitored periodically, and the wells shut down once the concentration of TVO drops below a value of 10 ppb (see discussion in "Consistency With Other Environmental Requirements" section). Based on the modeling simulations, it appears feasible to shut down the deeper wells after pumping for five years. The upper zone wells, adjacent to the landfill, would have to remain in operation as long as the landfill continued to serve as an active source of groundwater contamination.

The extracted groundwater would undergo treatment prior to discharge to either Absecon Creek or the ACUA wastewater treatment plant. Landfill closure and a groundwater monitoring program would also be required. Treatment, closure, and monitoring are discussed later.

Alternative 3 - Containment Wall with Plume Abatement

Remedial Alternative 3 consists of a combination of groundwater extraction wells and the installation of a containment wall to provide for the control of the contaminant source. Under this alternative, there would be three clusters of groundwater extraction wells; two (shallow and deep) located in the area of the contaminant plume and the third (shallow) situated within the perimeter of the containment wall. The wells located within the area of the contaminant plume would include a series of deep wells which would pump at a combined rate of approximately 1.1 mgd for an estimated five years to extract groundwater containing an average TVO concentration of 1 ppm. Shallow wells, adjacent to the landfill and near Mill Road, would pump at a combined rate of approximately 100,000 gpd for an estimated five years to extract groundwater having a TVO concentration of up to 50 ppm. The wells which would be located within the confines of the containment wall would pump at a combined rate of approximately 160,000 gpd for an estimated period of 25 years.

Both zones of the upper Cohansey sands would remain contaminated, as would the upper Cohansey clay. Some movement of contaminants into the mid-Cohansey clay is possible, but, based on the model results, it does not appear that it would penetrate the lower Cohansey Formation itself.

It should be noted that groundwater sampling has shown that the major contaminant constituents throughout plume include benzene, chloroform, 1,2-transdichloroethane, and tetrachloroethylene. Each of these compounds has an unacceptably high lifetime carcinogenic risk in drinking water when ingested. From a public health objective, no part of the aquifer between the landfill and Absecon Creek could be considered safe for drinking.

Alternative 2 - Plume Abatement

Remedial Alternative 2 is based on a plume abatement system consisting of shallow and deep groundwater extraction wells located east of the landfill. A series of shallow wells along Mill Road near the landfill, serving as source control wells, would be screened in the upper portion of the upper Cohansey aquifer (layer 5 in Figure 5) and pumped at a combined rate of approximately 200,000 gallons per day (gpd). These wells would serve to mitigate migration of contaminants from the landfill in the aquifer. The wells would extract groundwater having a TVO concentration fluctuating to as high as 50 ppm. These shallow wells would continue to pump for an estimated 25 years, which is the estimated time that the landfill will continue to be an active source of contamination.

In addition, a series of deeper wells would be located further hydraulically downgradient from the landfill and screened in the contaminant plume, above the mid-Cohansey clay (layer 3 in Figure 5). These wells, serving as plume abatement wells, would pump at a combined rate of approximately 1.1 mgd and extract groundwater having an average TVO concentration of 1 ppm. These deeper wells would continue to pump for a period of approximately five years, which is the estimated time it will take to extract the majority of the contamination (to 10 ppb, or less) once the source of additional contamination to the groundwater has been controlled. After that time, they would be removed from service.

The model predicted piezometric heads resulting from the implementation of this alternative are shown in Figures 9 and 10, where the cone of influence of the wells in both zones of the upper Cohansey aquifer is delineated. The predicted TVO concentrations in layer 3 at year 5 and layer 5 at year 20 are shown in Figures 11 and 12. The concentrations in the groundwater extracted from the shallow wells are expected to range from 30 ppm to 500 ppb over this time period and stabilize as these wells begin to fully extract the leachate from the landfill.

It is noted that the cone of influence from these new wells does not encompass the landfill; a "saddle point" in the flow field in the lower Cohansey aquifer exists just to the north of the landfill. The flow fields in the upper Cohansey aquifer, where most of the contamination is found, are toward the east and northeast. In all of the simulations, no movement of contaminants toward the new wellfield was noted.

ALTERNATIVES EVALUATION

Alternative 1 - No Action (minimal action)

Remedial Alternative 1 includes no remedial action at Price Landfill beyond closure and a groundwater monitoring program.

Based on computer modeling, the effects of pumping the relocated ACMUA wellfield at 13.5 mgd north of the reservoir are pronounced in the lower Cohansey, as shown in Figure 6, which indicates that a groundwater divide is formed along a northeast-southwest transect slightly north of the landfill. While this divide is located in the lower Cohansey only, it provides a partial barrier to inhibit contaminant migration toward the new wellfield should contaminants break through the mid-Cohansey clay.

The key features of the projected plume after 20 years are shown in Figures 7 and 8. The plan view shows that the plume would continue to travel to the east and northeast, but that it would be roughly confined at its eastern boundary by Conover Run and Absecon Creek. The cross-section shown in Figure 8 indicates that the plume would continue to move down through the upper Cohansey clay as it moves away from the landfill, travel along the lower zone of the upper Cohansey and then begin to move upward through the upper Cohansey clay (intermediate lenses) as the gradients toward Absecon Creek dominate the flow field. Upward movement through the upper Cohansey clay (intermediate lenses) is quite slow, hence the concentrating of contaminants near Absecon Creek and along the lower reaches of Conover Run. This upward movement would be different from that which would be observed under past pumping operations, where the plume would have continued to move downward through the mid-Cohansey clay to the lower Cohansey zone and would have contaminated the ACMUA production wells (at the original wellfield location). The limits of the plume shown in Figure 7 indicate the region in which contaminants would be expected to be found.

In general, under Remedial Alternative 1, the whole area between the landfill and Absecon Creek/Conover Run would be underlain by a plume of contaminated groundwater. The discharges of this groundwater would be to surface water in these streams and to the adjoining marshlands.

REMEDIAL ALTERNATIVES

The initial RI/FS, which led to the September 20, 1983 ROD, considered fifteen remedial alternatives. Those alternatives were screened on the basis of preliminary modeling results, cost estimates, and an evaluation of technical and institutional considerations. Five alternatives were screened out at that initial stage. The ten remaining alternatives were evaluated for the non-cost criteria of reliability, feasibility of implementation, operation and maintenance, environmental impact, and safety concerns. It was determined that the ACMUA water supply wellfield should be relocated and that further environmental data should be collected to evaluate source control and plume management alternatives. Additionally, the treatability of Price Landfill leachate in the Atlantic County Utilities Authority (ACUA) wastewater treatment plant was to be determined.

The four remedial alternatives considered by the current RI/FS for implementation at Price Landfill reflect the recommendation of the 1983 ROD. The individual remedial alternatives are:

1. No action (minimal action)
2. Plume abatement
3. Containment wall with plume abatement
4. Containment wall with plume abatement and flushing

Computer Modeling

Computer modeling was utilized as a tool to simulate the effectiveness the four remedial action alternatives in mitigating contamination emanating from the landfill. The horizontal grid geometry used in the modeling is shown in Figure 4. A five layer representation of the stratigraphy of the area, as shown in Figure 5, was used for the vertical geometry. Detailed simulations were made for Alternatives 1, 2, and 3. The accelerated flushing alternative (4) was not independently simulated, since its off-site characteristics were the same as those of Alternative 2. Flushing of the unsaturated zone within the landfill was not simulated (as described in Alternative 4).

In each case, the alternatives were evaluated over a time span of 20 years, beginning at 1984, under the assumption that the landfill would continue as a contaminant source for at least that period. It should be noted that the relocated ACMUA wellfield was coming on-line during the modeling effort and that the original ACMUA wells were being taken out of production as the relocated wells were brought into operation. Thus, all alternatives were evaluated for a pumping scenario where the relocated ACMUA wells were pumped at a design rate of 1.5 mgd each, and all other ACMUA wells were off-line. The piezometric heads in the lower Cohansey under this alternative are shown in Figure 6.

Four-inch diameter stainless steel casings and screens were installed at each well location. The majority of the wells were placed in cluster formations, with several wells penetrating into the lower Cohansey Formation.

Groundwater sampling was conducted at 55 locations (22 new wells; 33 existing). An additional 17 blanks and duplicates resulted in 72 samples being analyzed for priority pollutants.

Existing Contamination

The previous monitoring data, plus data collected during the most recent RI/FS, indicated that there are considerable quantities of hazardous waste contaminants in the groundwater system adjacent to Price Landfill. The most recent sampling and analysis for groundwater contamination indicated the presence of benzene, cadmium, chloroform, dichloroethylene, lead, 1-2-transdichloroethylene, trichloroethylene, vinyl chloride, and acetone in the upper Cohansey Formation. Total volatile organics (TVO) concentrations range from 40 to 50 parts per million (ppm) near the landfill in the shallow depths of the upper Cohansey Formation. TVO concentrations range from 10 to 1000 parts per billion (ppb) in the deeper areas of the aquifer, with the plume extending almost one mile from the landfill (see Figure 3 and Table 1) and tending to move in an east-northeasterly direction.

Status of Remedial Activities

The preliminary remedial activities associated with Price Landfill focused on the relocation of the ACMUA wellfield from its former site approximately 0.7 miles east of the landfill. The original wellfield consisted of four shallow (upper Cohansey) and six deep (lower Cohansey) production wells, pumping at approximately 13 mgd.

The relocated wellfield, which consists of nine production wells and was completed in December 1985, is located approximately two miles northwest of the landfill, on the northern shore of the western ACMUA reservoir. Each of the nine new production wells is screened in the lower Cohansey Formation at depths of up to 200 feet and has a pumping capacity of approximately 1.5 mgd.

The relocation of the ACMUA wellfield represented the initial phase of the proposed remedial action to alleviate potential public health impacts resulting from groundwater contamination in the area of Price Landfill.

investigation and feasibility study (RI/FS) was undertaken by the U.S. Environmental Protection Agency (EPA) at Price Landfill. During the summer of 1982, as the RI/FS was being prepared, EPA and the State of New Jersey implemented several initial remedial measures at the ACMUA water treatment plant in the event that the contaminant plume reached the ACMUA public water supply wellfield. These measures included the construction of an interconnection with the NJWC system, redevelopment of three ACMUA production wells, installation of granular activated carbon filtration units, and implementation of a water conservation program. On September 20, 1983, EPA issued a Record of Decision (ROD) based on the results of the initial RI/FS. The selected option included:

- Abandonment of the ACMUA existing upper and lower Cohansey aquifer water supply wellfield;
- Relocation and replacement of the ACMUA wellfield and transmission facilities to provide a 13.5 million gallons per day (mgd) capacity;
- Consideration, in addition to the wellfield relocation, of plume management, source control, and groundwater treatment alternatives.

A second RI/FS, described below, was conducted in 1984 to comply with the 1983 ROD. As the RI/FS was progressing, EPA began negotiations for the implementation of the recommended remedy with identified potentially responsible parties. Approximately twenty-three separate meetings and court appearances were held with representatives of EPA, New Jersey Department of Environmental Protection (NJDEP), and the potentially responsible parties, resulting in a tentative $17.15 million cash settlement for past and future costs. A public meeting to present the recommended remedy was held in July 1986.

CURRENT SITE STATUS

Field Investigation Program

The field investigation activities conducted as part of the most recent remedial investigation were performed, under a cooperative agreement with EPA, by the NJDEP, through its contractor, Camp Dresser and McKee (CDM). The investigation included the installation of 22 additional groundwater monitoring wells and six soil borings during the spring of 1984. This program was preceded by a geophysical survey, employing both seismic refraction and ground penetrating radar, to better identify the boundaries of the landfill and assist in selecting locations for the monitoring wells and soil borings (see Figure 2). The soil borings were used to better define the geology at the site.

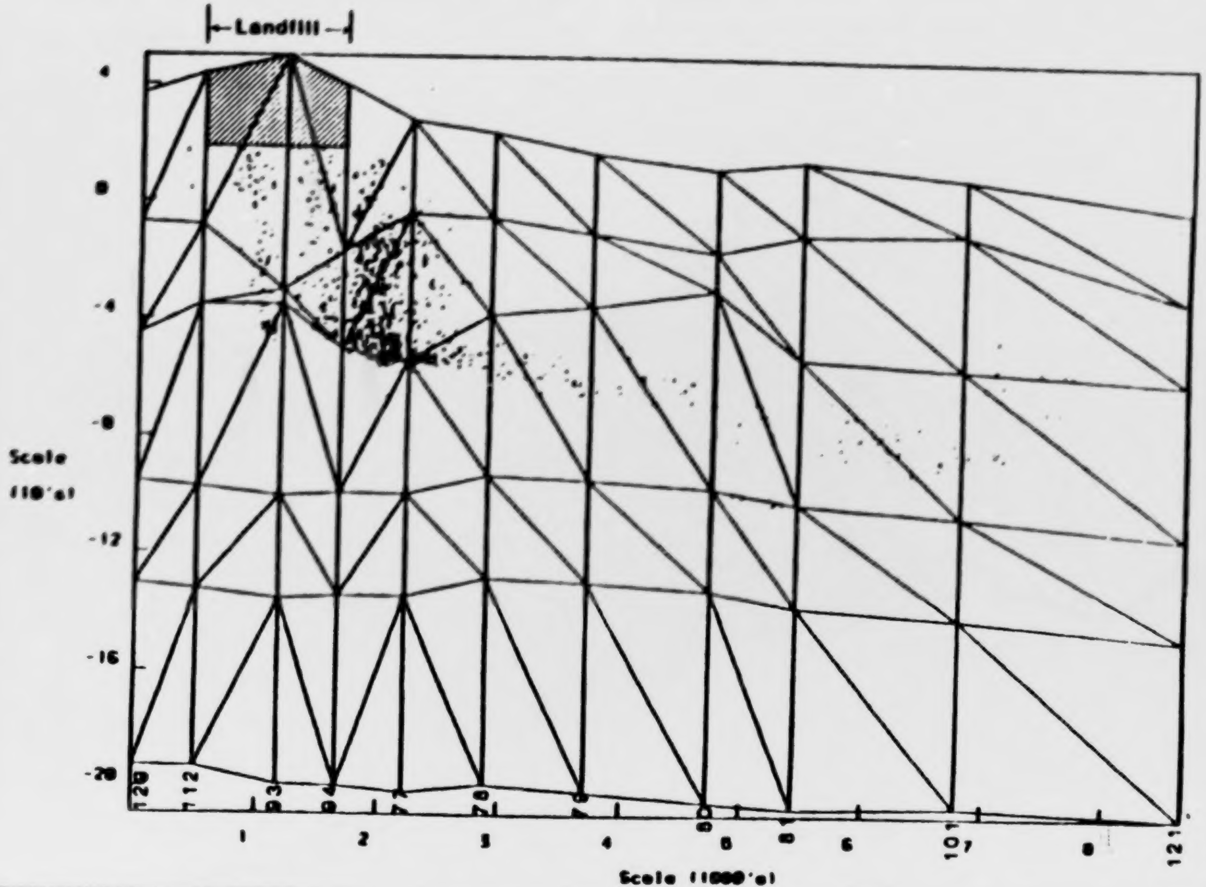

Landfill
4
0
-4
-8
-12
-16
-20
Scale
(10's)
120
112
93
94
77
78
80
81
101
121
1
2
3
4
5
6
7
8
Scale (1000's)

FIGURE 8 NO-ACTION ALTERNATIVE--CONTAMINANT PLUME AT YEAR 20-SECTION ALONG PLUME CENTERLINE

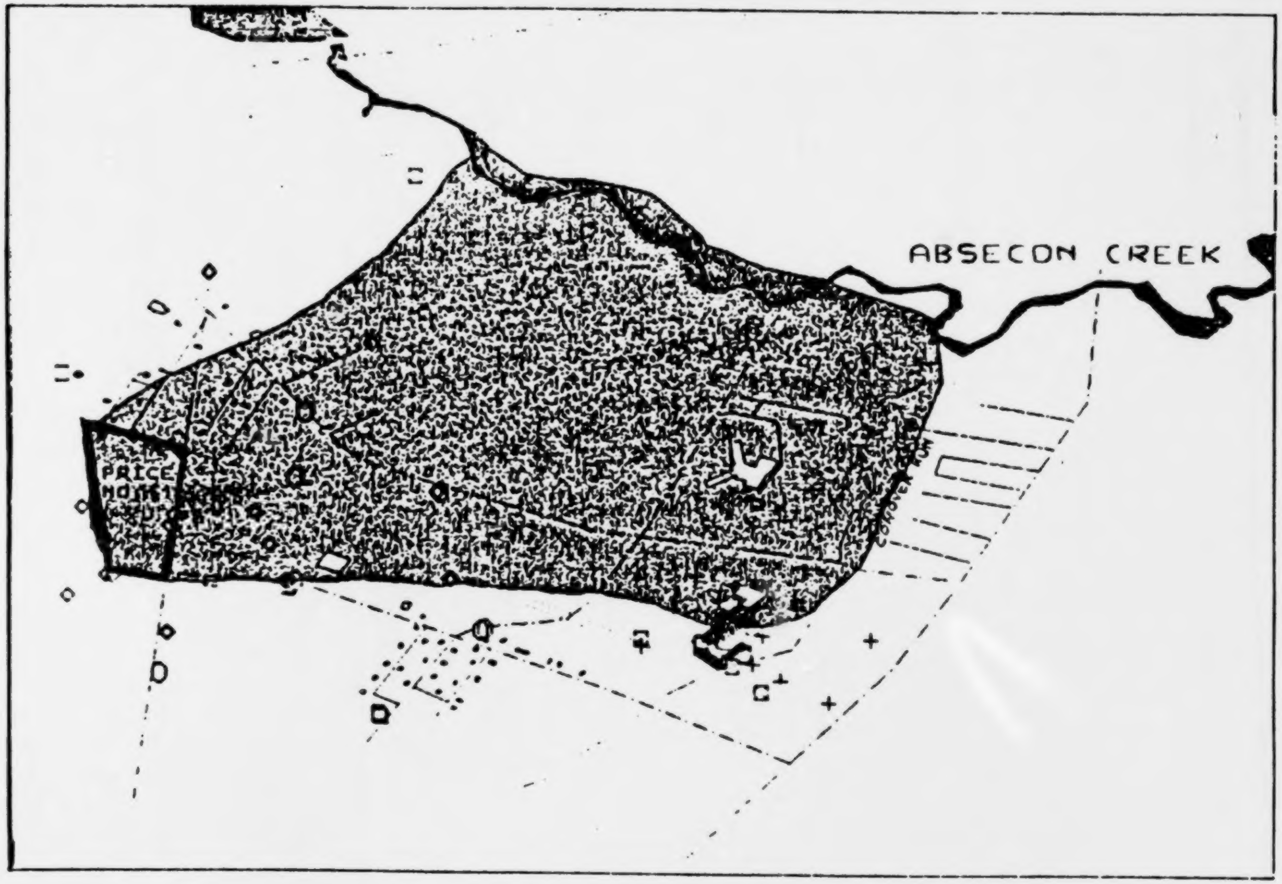

ABSECON CREEK
PRICE

FIGURE 7 : NO-ACTION (MINIMAL ACTION) ALTERNATIVE --
CONTAMINANT PLUME AT YEAR 20

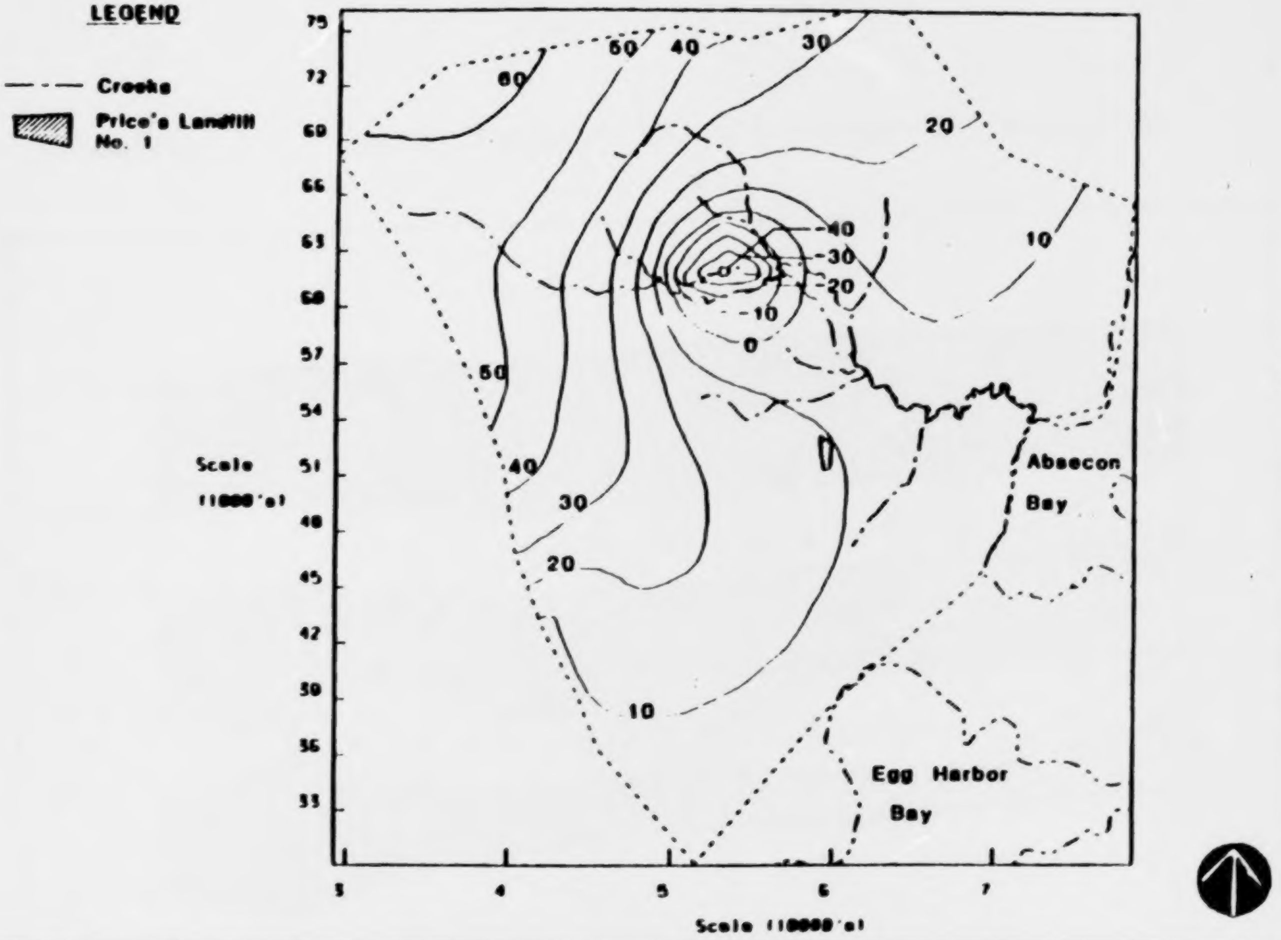

LEGEND
Creeks
Price's Landfill No. 1
Scale (1000's)
75
72
69
66
63
60
57
54
51
48
45
42
39
36
33
3
4
5
6
7
Scale (10000's)
60
50
40
30
20
10
0
-10
-20
-30
-40
Absecon Bay
Egg Harbor Bay

FIGURE 6 PIEZOMETRIC HEADS IN LOWER COHANSEY WITH NEW WELLFIELD

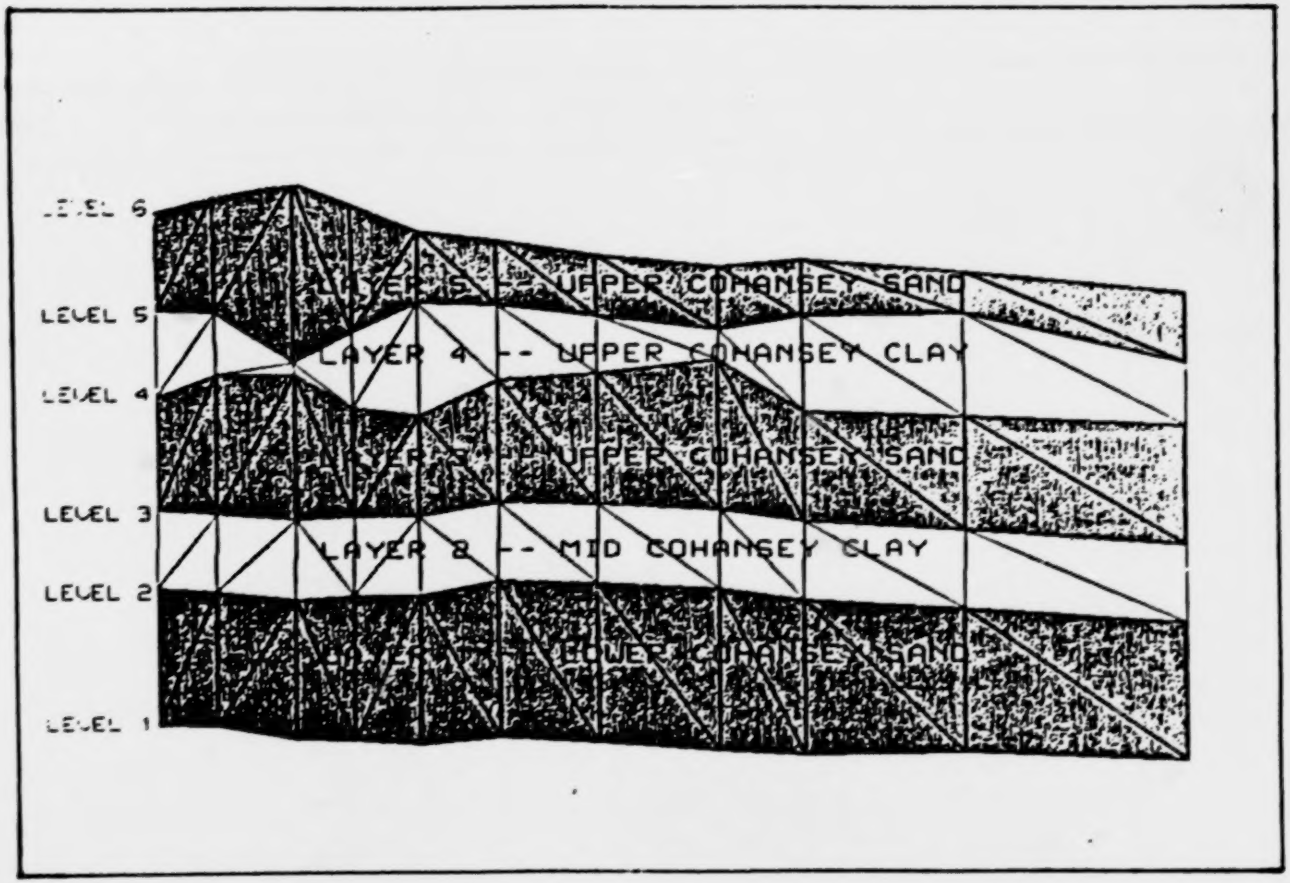

LEVEL 6
LEVEL 5
LEVEL 4
LEVEL 3
LEVEL 2
LEVEL 1
LAYER 5 -- UPPER COHANSEY SAND
LAYER 4 -- UPPER COHANSEY CLAY
LAYER 3 -- UPPER COHANSEY SAND
LAYER 2 -- MID COHANSEY CLAY
LAYER 1 -- LOWER COHANSEY SAND

FIGURE 5 : PRICES LANDFILL NO. 1 - TYPICAL CROSS-SECTION

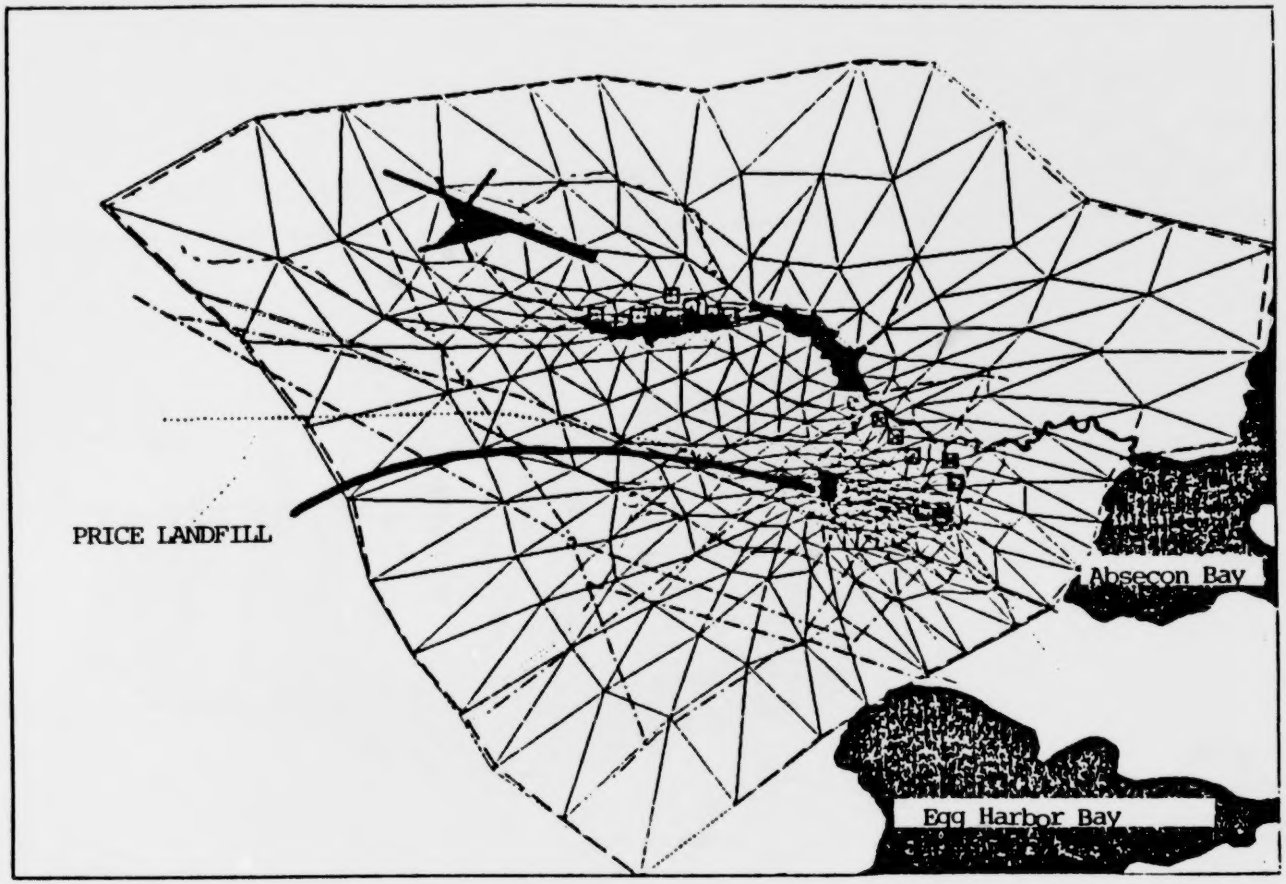

PRICE LANDFILL
Absecon Bay
Egg Harbor Bay

FIGURE 4 : FINITE ELEMENT GRID

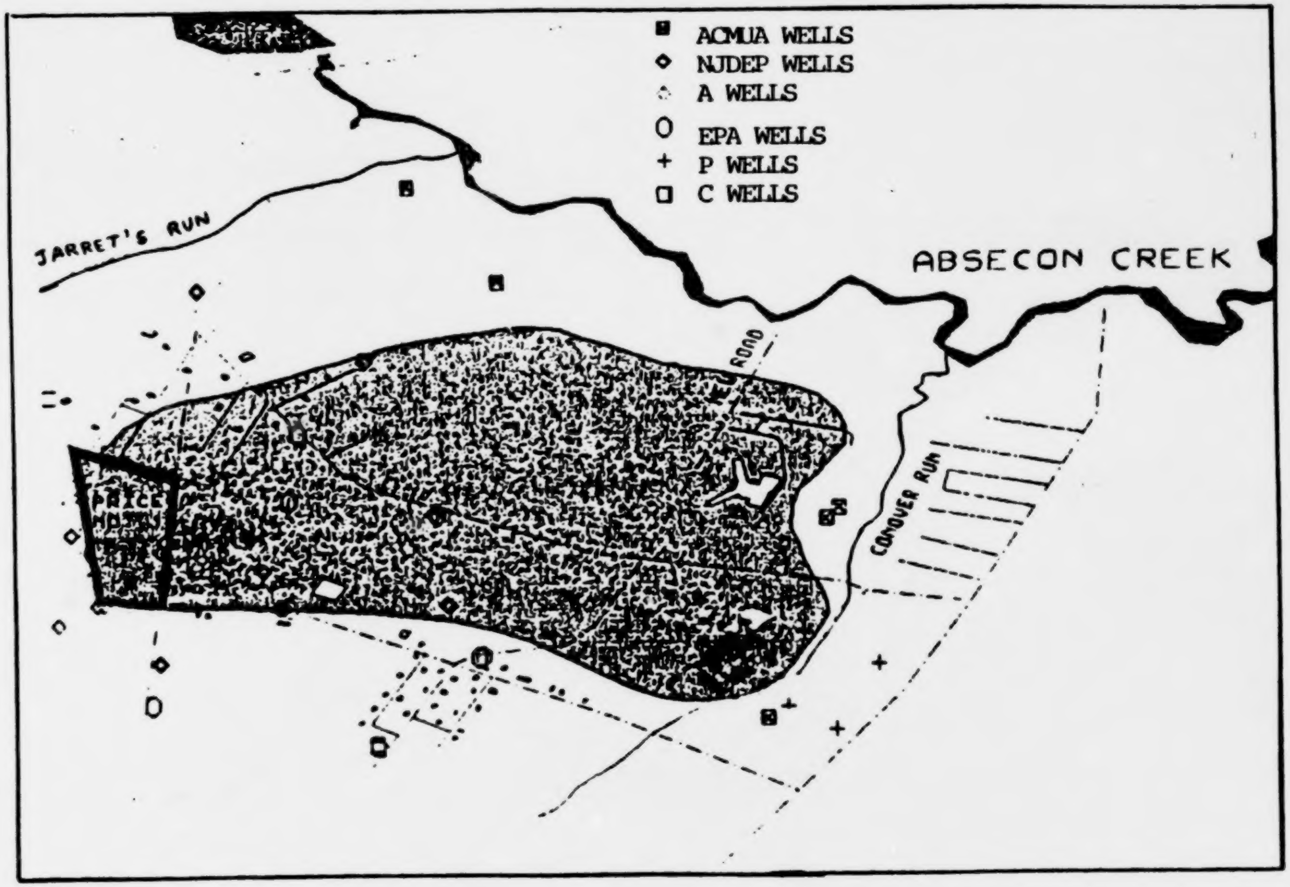

ACMUA WELLS
NJDEP WELLS
A WELLS
EPA WELLS
P WELLS
C WELLS
ABSECON CREEK
JARRET'S RUN
CONOVER RUN
ROAD
PRICE

FIGURE 3 : PLAN VIEW OF 1984 PLUME FOR CALIBRATED MODEL

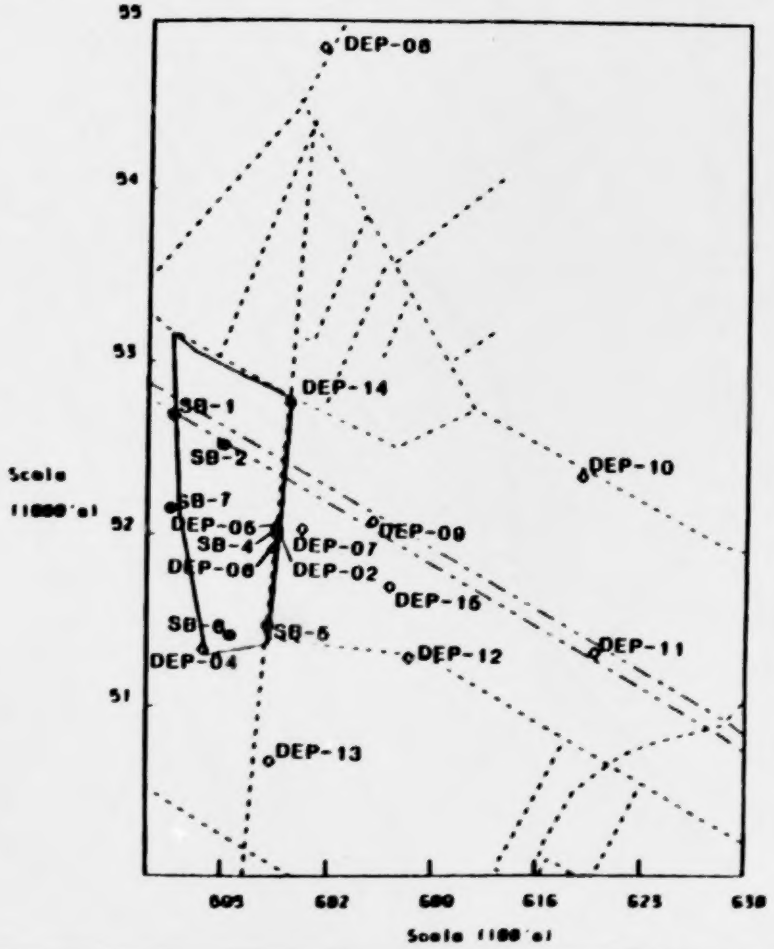

55
54
53
52
51
Scale (1000's)
DEP-08
DEP-14
SB-1
SB-2
SB-7
DEP-10
DEP-06
SB-4
DEP-07
DEP-09
DEP-08
DEP-02
DEP-16
SB-6
SB-5
DEP-04
DEP-12
DEP-11
DEP-13
595
602
609
616
625
630
Scale (100's)

FIGURE 2 SITE MAP SHOWING LOCATION OF NEW WELLS AND BORINGS

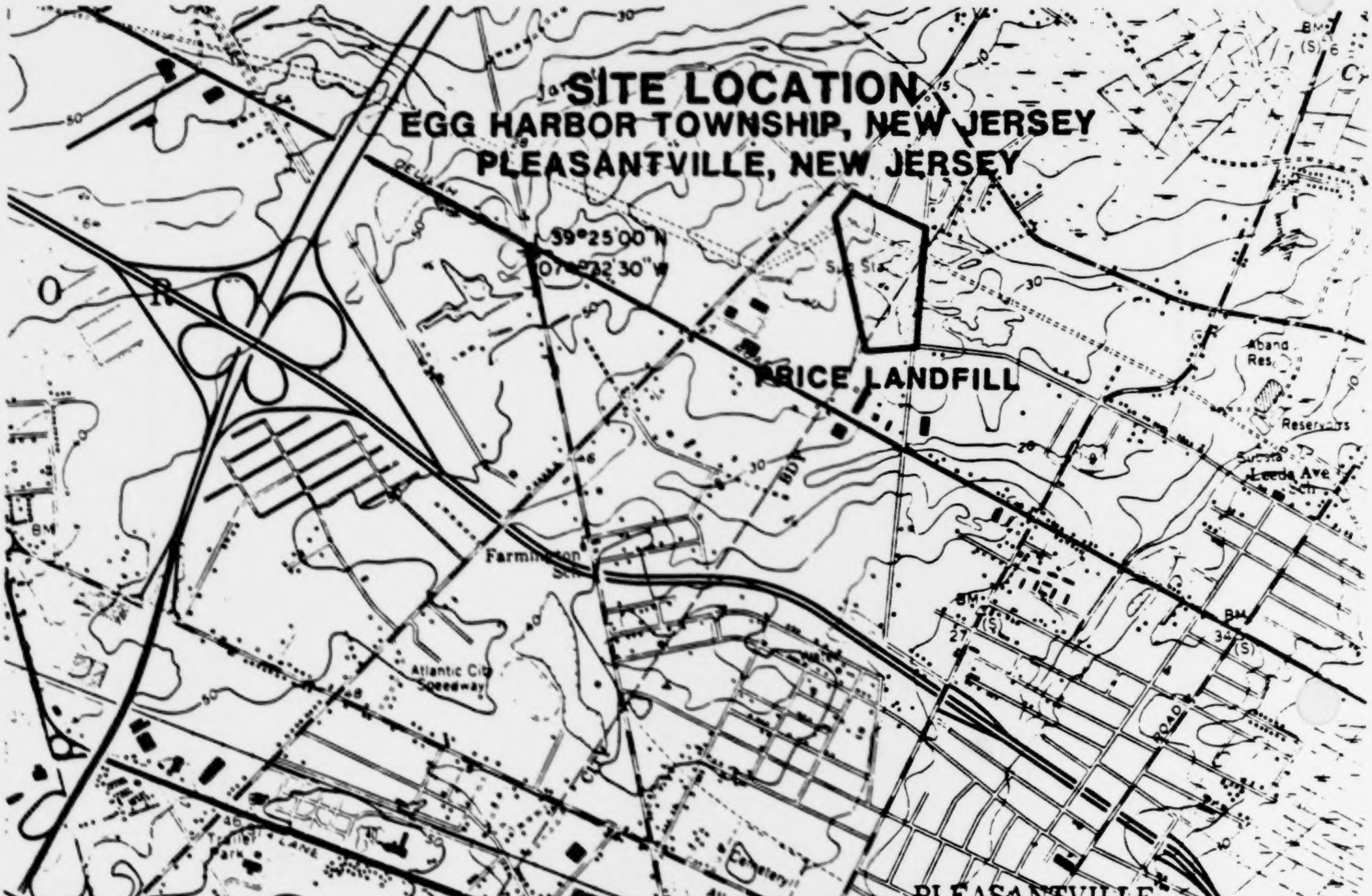

SITE LOCATION
EGG HARBOR TOWNSHIP, NEW JERSEY
PLEASANTVILLE, NEW JERSEY
39°25'00"N
074°32'30"W
PRICE LANDFILL
Farmington Sch
Atlantic City Speedway
Cemetery
Atlantic City Cemetery
VERONA
PLEASANTVILLE
Aband Res
Reservoirs
Leeds Ave Sch
Tollgate
Sewage Disposal
Radio Tower
READING
SEASHORE
TOWNSHIP
CITY
High Sch
Municipal Yacht Basin
County Farm
Bayside Sch
Birch Grove Park
PLEASANTVILLE
NEW JERSEY
Northfield
EGG H
PLEASANTVILLE, NJ
SCALE 1:24,000
LAKES

Figure 1

Table 1 (continued)

Measured and Computed Concentration of Total Volatile Organics at Monitoring Wells

Well	1984 Measured (Range) ppb	Previous Measurements ppb	Computed Results (Range) ppb
A-4	2.6 - 29	ND	ND
C-1A	7-9.7	40-115	ND-101
C-2A	ND-1.2	ND-6	15
C-2B	ND-1.2	ND-7	31-8
C-3A	ND	ND-130	ND
C-3B	ND-27	8-516	ND
C-4B	ND-1.2	ND	ND
C-4C	ND-1.2	3-26	ND
C-5B	27-28	11-22	3.8-21
C-6	4094-7672	ND-799	ND
C-7	ND	10-177	ND
C-8	13.5-33	3-306	9
C-9	ND	ND	ND
DEP-8I	ND	-	ND
DEP-9I	656-1632	-	857
DEP-11I	ND	-	11
DEP-12I*	15-17	-	11
DEP-13S/I	ND	-	ND
DEP-4I	ND	-	142
P-1	ND-1	ND-35	ND
P-4	NA	NA	ND
P-7	NA	7	85
P-8	1.3-1.2	ND-57	102
P-9	NA	24	ND
P-12	NA	NA	6

* NOTE: DEP-9I and -12I are screened partially in this formation and partially in the clay layer table.

Table 1 (continued)

Measured and Computed Concentrations of Total Volatile Organics* at Monitoring Wells

Monitoring Well Lower Cohansey	1984 Measured (Range) ppb	Previous Measurement ppb	Computed Results (Range) ppb
A-1	50	NA	ND
A-3	ND	2-20	ND
C-4A	ND	160-200	ND
C-5A	29-38	ND	ND
P-2	ND	23-38	ND
P-3	ND	ND	ND
P-5	NA	ND	ND
P-6	NA	ND	ND
DEP-4D	ND -1.7	--	ND
DEP-8D	ND	--	ND
DEP-10D	ND-45	--	ND
DEP-11D	ND	--	ND
DEP-12D	ND	--	ND
DEP-13D	<5-31	--	ND

Table 2

TREATMENT ALTERNATIVES FOR GROUNDWATER EXTRACTED FROM PRICE LANDFILL

Treatment Alternative	Associated Remedial Alternative	
	#2 Plume Abatement (MGD)	#3 Containment Wall (MGD)
Physical/Chemical Pretreatment*		
1. Total Flow**	1.3	1.36
2. Partial Flow***	.2	.26
Air Stripping/Lime Pretreatment*		
3. Total Flow**	1.3	1.36
4. Partial Flow***	.2	.26
Lime Pretreatment		
5. Total Flow	1.3	1.36

*Flow passsing through air stripper.
**Dilute flow stream and concentrated stream to air stripper.
***Concentrated flow stream with 50 ppm volatiles to air stripper.

Table 3

CAPITAL COSTS OF TREATMENT SYSTEMS
PRICE'S LANDFILL NUMBER 1
($ × 1000)

Item	Chemical/Physical Treatment (Total Flow)[1]	Chemical/Physical Treatment (Partial Flow)[1]	Air Stripping/Lime Pretreatment (Total Flow)	Air Stripping/Lime Pretreatment (Partial Flow)	Lime Addition Pretreatment
PUMP STATION	255	255	255	255	255
FORCE MAIN	120	120	385	385	385
SO_2 FEED SYSTEM	20	5	20	5	--
AIR STRIPPING WITH SOLVENT RECOVERY	710	200	710	200	--
GAC TREATMENT WITH PREFILTRATION	905	1,520	--	--	--
LIME ADDITION FACILITY A	91	80	91	80	75
LIME ADDITION FACILITY B*	--	--	325	120	310
FLOCCULATION/PRECIPITATION STRUCTURES	750	750	750	750	750
BUILDING STRUCTURE	825	850	565	120	80
SLUDGE DISPOSAL	450	450	450	450	450
INSTRUMENTATION	55	60	44	15	30
ELECTRICAL SITE WORK	190	195	140	95	90
SITE WORK AND YARD PIPING	165	170	135	85	80
ENGINEERING AND CONTINGENCIES	875	980	625	515	416
TREATMENT COST TOTAL WITH ONSITE METAL PRECIPITATION	5,411	5,635	4,170	2,995	2,611
TREATMENT COST TOTAL WITH LIME ADDITION AT ACUA	--	--	2,870	1,875	1,546

*Lime addition facility B is located at the ACUA facility.

**Reflects a total flow of 1.36 mgd through the GAC although only .26 mgd (concentrated stream) was originally passed through the air stripper.

[1] Quantity of flow passing through air stripper.

Table 4

ANNUAL OPERATING AND MAINTENANCE COSTS
TREATMENT SYSTEMS
PRICE'S LANDFILL NUMBER 1
($ x 1000)

Item	Chemical/Physical Treatment		Air Stripping/Lime Pretreatment		Lime Addition Pretreatment
	(Total Flow)	(Partial Flow)	(Total Flow)	(Partial Flow)	
POWER	35	35	31	27	15
CHEMICALS	1,652	1,764	302 (620)	234 (472)	57 (285)
PERSONNEL	50	50	40	25	15
WELL REGENERATION	1	1	1	1	1
SLUDGE DISPOSAL*	175 540	175 540	175 540	175 540	175 540
MAINTENANCE	30	30	24	10	10
SUBTOTAL	1,943 2,307	2,055 2,424	651 1,017	472 836	273 637
ACU TREATMENT** CHARGE	- -	- -	520 520	520 520	530 530
TREATMENT O&M TOTAL WITH ONSITE METAL PRECIPITATION	1,943 2,307	2,055 2,424	1 173 1,537	992 1,356	803 1,167
TREATMENT O&M TOTALS WITH LIME ADDITION AT ACUA	--	--	1,216	1,055	915

*The low costs are associated with the disposal of a non-hazardous sludge while the high costs are associated with disposal of a hazardous sludge.

( )Chemical cost associated with lime addition at the ACUA facility

**Based upon $1,066.00 per million gallons plus incremental charges for BOD and TSS

TABLE 5
PRESENT WORTH ANALYSIS TREATMENT SYSTEMS*
($ x 1000)

Item	Chemical/Physical Treatment				Air Stripping/Lime Pretreatment				Lime Addition Pretreatment	
	(Total Flow)		(Partial Flow)		(Total Flow)		(Partial Flow)			
Capital Costs	5,411		5,635		4,170		2,995		2,611	
Annual O&M Costs	1,943	1,307	2,055	1,424	1,173	1,537	992	1,356	803	1,167
Present Worth 25 yrs.	23,050	26,350	24,300	27,600	14,820	18,120	12,000	15,300	9,900	13,200

*Costs associated with onsite metal preceipitation and sludge disposal. The low costs are associated with the disposal of a non-hazardous sludge while the high costs are associated with the disposal of a hazardous sludge.

TABLE 6

PRESENT WORTH ANALYSIS FOR METALS REMOVAL AT ACUA
($ x 1000)

	Air Stripping/Lime Pretreatment		Lime Addition Pretreatment
	(Total Flow)	(Partial Flow)	
Capital Costs	2,870	1,875	1,546
Annual O&M Costs	1,236	1,055	915
Present Worth 25 years @ 10%	14,090	11,450	9,850

Table 7

CAPITAL COSTS OF REMEDIAL ALTERNATIVES
PRICE'S LANDFILL NUMBER 1
($ X 1000)

	Physical-Chemical Treat.		Air Stripping/Lime Pretrt.		Lime Addition Pretreatment
	(Total Flow)	(Partial Flow)	(Total Flow)	(Partial Flow)	
PLUME ABATEMENT					
Treatment Facilities[A]	5,411	5,635	4,170 (2,870)[C]	2,995 (1,875)[C]	2,611 (1,546)[C]
Closure Cap	1,600	1,600	1,600	1,600	1.600
Extraction Wells	60	60	60	60	60
Engineering and Contingencies	330	330	330	330	300
TOTAL	7,400	7,630	6,160 (4,860)[C]	4,985 (3,870)[C]	4,600 (3,190)[C]
CONTAINMENT WALL AND PLUME					
Treatment Facilities[A]	5,411	5,635	4,170 (2,870)[C]	2,995 (1,875)[C]	2,611 (1,546)[C]
Containment Wall[B] (80 ft deep)	4,500	4,500	4,500	4,500	4,500
Closure Cap	1,600	1.600	1,600	1,600	1,600
Extraction Wells	90	90	90	90	90
Engineering and Contingencies	790	790	790	790	790
TOTAL	12,390	13,650	11,150 (9,850)[C]	9,980 (8,850)[C]	9,980 (8,150)[C]

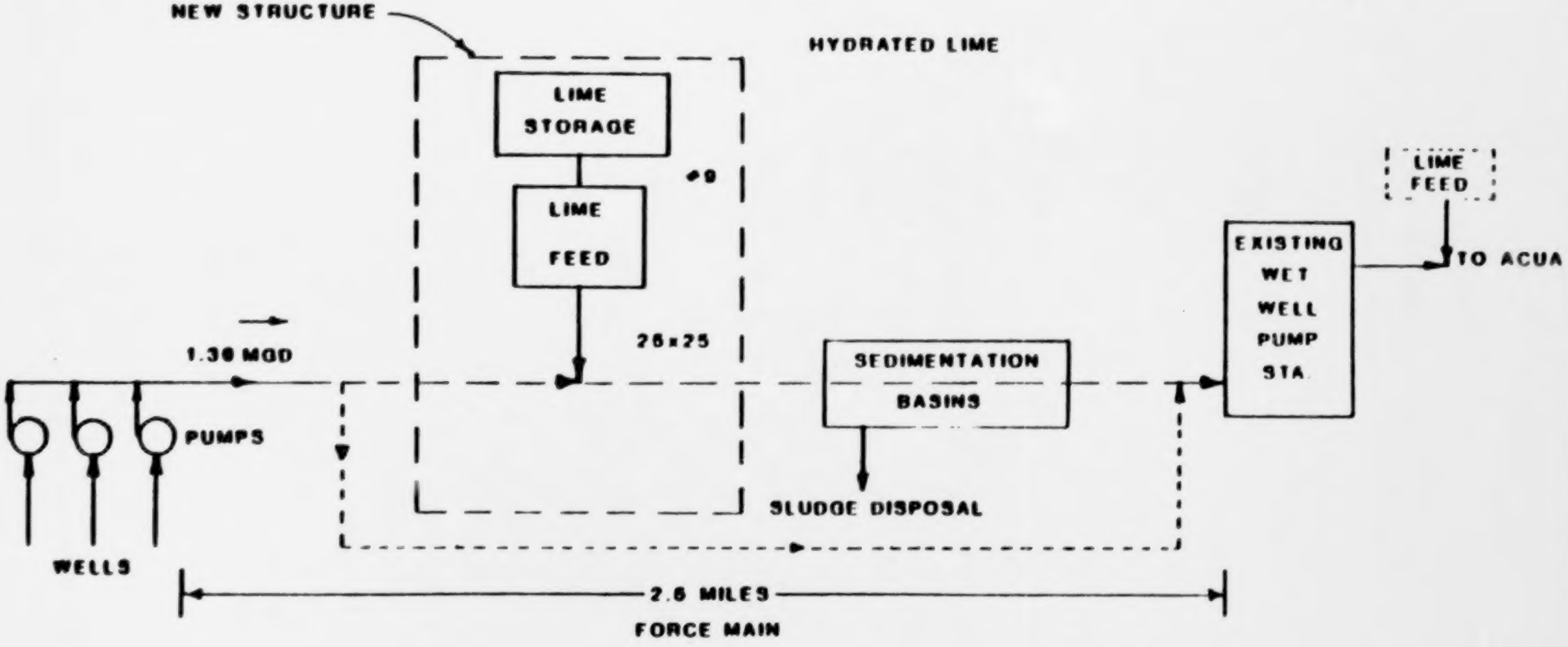
A. See Table
B. Includes installation costs of $7.00/ft^2, dispose of 10,000 yd^3 of spoils as a hazardous waste, relocation of 700 feet of 69 KVA power distribution lines, relocation of water main and sanitary sewers in Mill Road and property condemnation.
C. Lime addition at ACUA - Table

TABLE 1

Measured and Computed Concentrations of Total Volatile Organics at Monitoring Wells

Well	1984 Measured (Range) (ppb)	Previous Measurements (ppb)	Computer Results (Range) (ppb)
C-2C	ND-2	ND-13	ND
C-3C	ND	ND-15	ND
C-4D	ND-1.3	3-33	ND
C-5C	ND-6	2-300	ND
EPA-1	5664-10203	500-37000	5997
EPA-1A+	12243-21800	64-2175000	369-3484
EPA-2	ND-5	ND-393	ND
EPA-3	ND-10	ND-81	ND
EPA-4	ND-10	ND-41	ND
EPA-5	NA	ND-132	ND
EPA-5A	NA	ND-226	ND
DEP-1	51610-78840	ND-140000	3950
DEP-2	NA	18458-71000	269000
DEP-3	18-25	ND-126	0-126
DEP-4S+	ND-1.1	--	ND
DEP-5+	17420-24220	--	15584
DEP-6+	10805-12910	--	23867
DEP-7+	4305-5706	--	5373
DEP-95	13617-18740	--	59384
DEP-10I+	150-180	--	ND
DEP-12S	22-27	--	ND
DEP-14S	84-244	--	3127
DEP-15S	204-249	--	ND-600

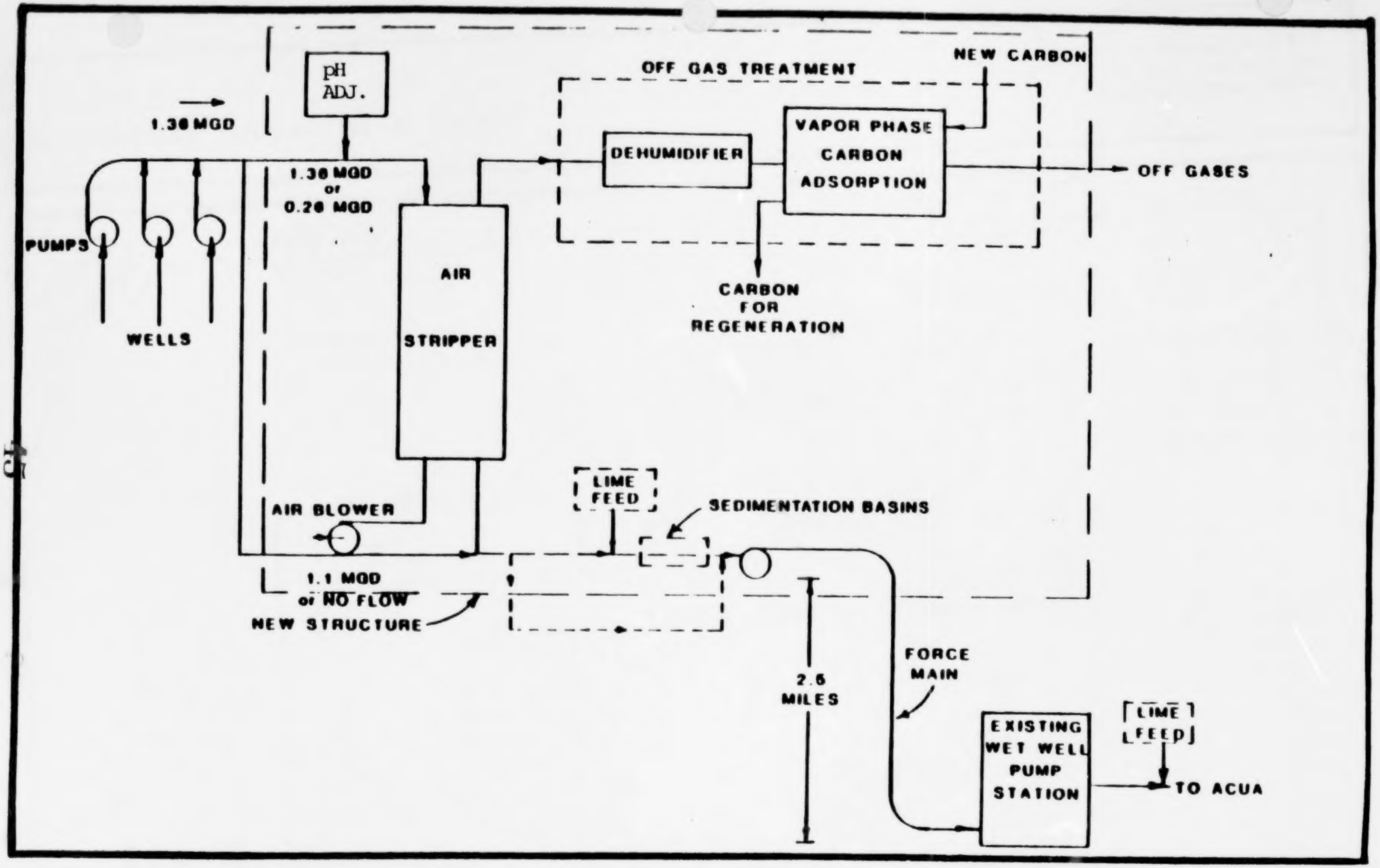
NOTE: + Wells are screened in section of layer 4 (Upper Cohansey Clay).


NEW STRUCTURE
HYDRATED LIME
LIME STORAGE
LIME FEED
#9
26x25
1.30 MGD
PUMPS
WELLS
SEDIMENTATION BASINS
SLUDGE DISPOSAL
EXISTING WET WELL PUMP STA.
LIME FEED
TO ACUA
2.6 MILES
FORCE MAIN

ALTERNATIVE TREATMENT SYSTEMS

Figure 17

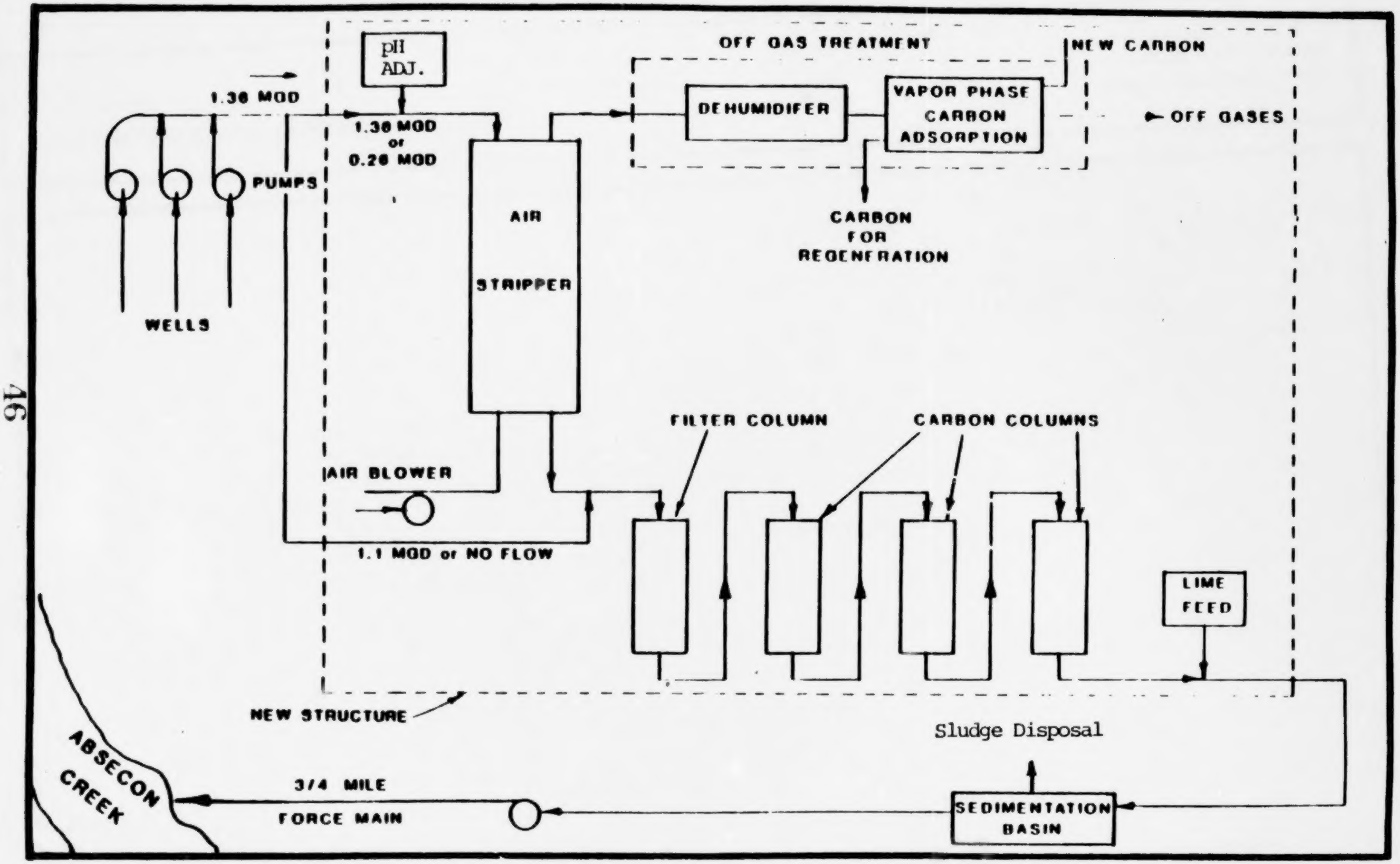
LIME PRETREATMENT
ALTERNATIVE 5


1.30 MGD
pH ADJ.
1.30 MGD or 0.26 MGD
PUMPS
WELLS
AIR STRIPPER
AIR BLOWER
1.1 MGD or NO FLOW
NEW STRUCTURE
OFF GAS TREATMENT
DEHUMIDIFIER
VAPOR PHASE CARBON ADSORPTION
NEW CARBON
OFF GASES
CARBON FOR REGENERATION
LIME FEED
SEDIMENTATION BASINS
2.6 MILES
FORCE MAIN
EXISTING WET WELL PUMP STATION
LIME FEED
TO ACUA

ALTERNATIVE TREATMENT SYSTEMS

Figure 16

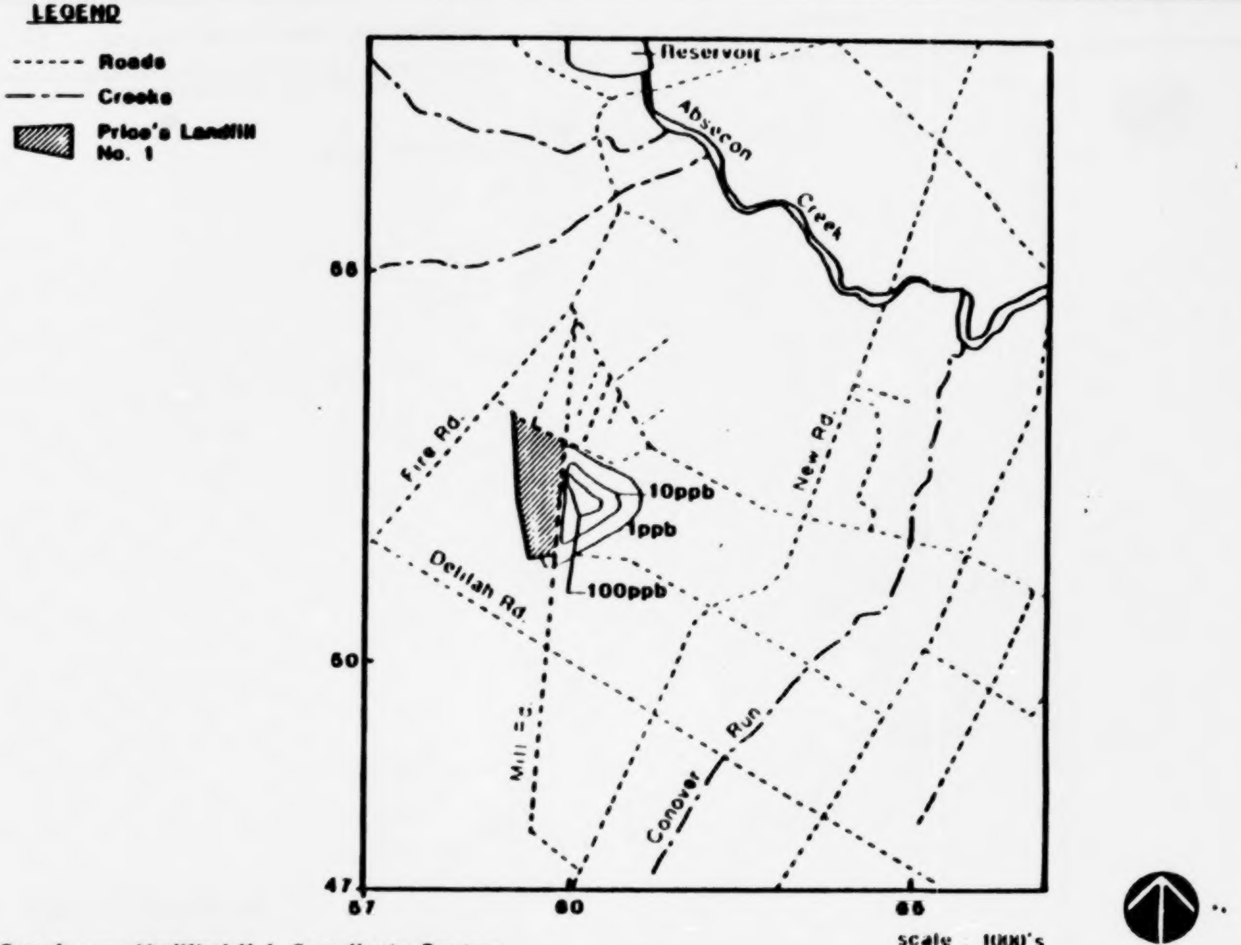
AIR STRIPPING/LIME
PRETREATMENT
ALTERNATIVES 3 & 4


pH
ADJ.
1.36 MGD
1.36 MGD
or
0.26 MGD
PUMPS
WELLS
AIR
STRIPPER
OFF GAS TREATMENT
DEHUMIDIFER
VAPOR PHASE
CARBON
ADSORPTION
NEW CARBON
OFF GASES
CARBON
FOR
REGENERATION
AIR BLOWER
1.1 MGD or NO FLOW
FILTER COLUMN
CARBON COLUMNS
LIME
FEED
NEW STRUCTURE
Sludge Disposal
SEDIMENTATION
BASIN
3/4 MILE
FORCE MAIN
ABSECON
CREEK

ALTERNATIVE TREATMENT SYSTEMS

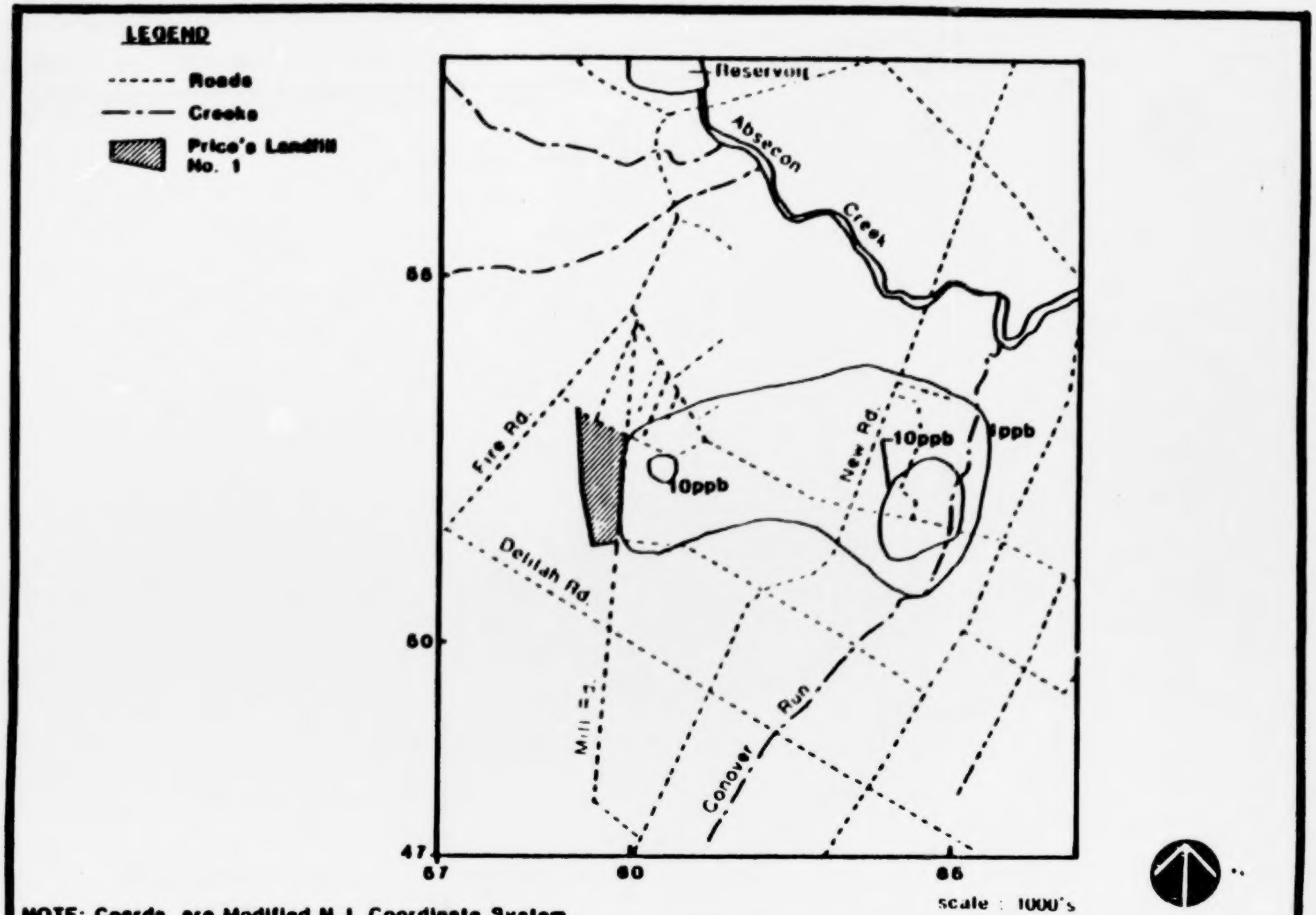
Figure 15

PHYSICAL-CHEMICAL
ON SITE TREATMENT
ALTERNATIVES 1 & 2


LEGEND
Roads
Creeks
Price's Landfill No. 1
Reservoir
Absecon Creek
Fire Rd.
Delilah Rd.
Mill Rd.
New Rd.
Conover Run
10ppb
1ppb
100ppb
68
60
47
57
60
65
scale : 1000's

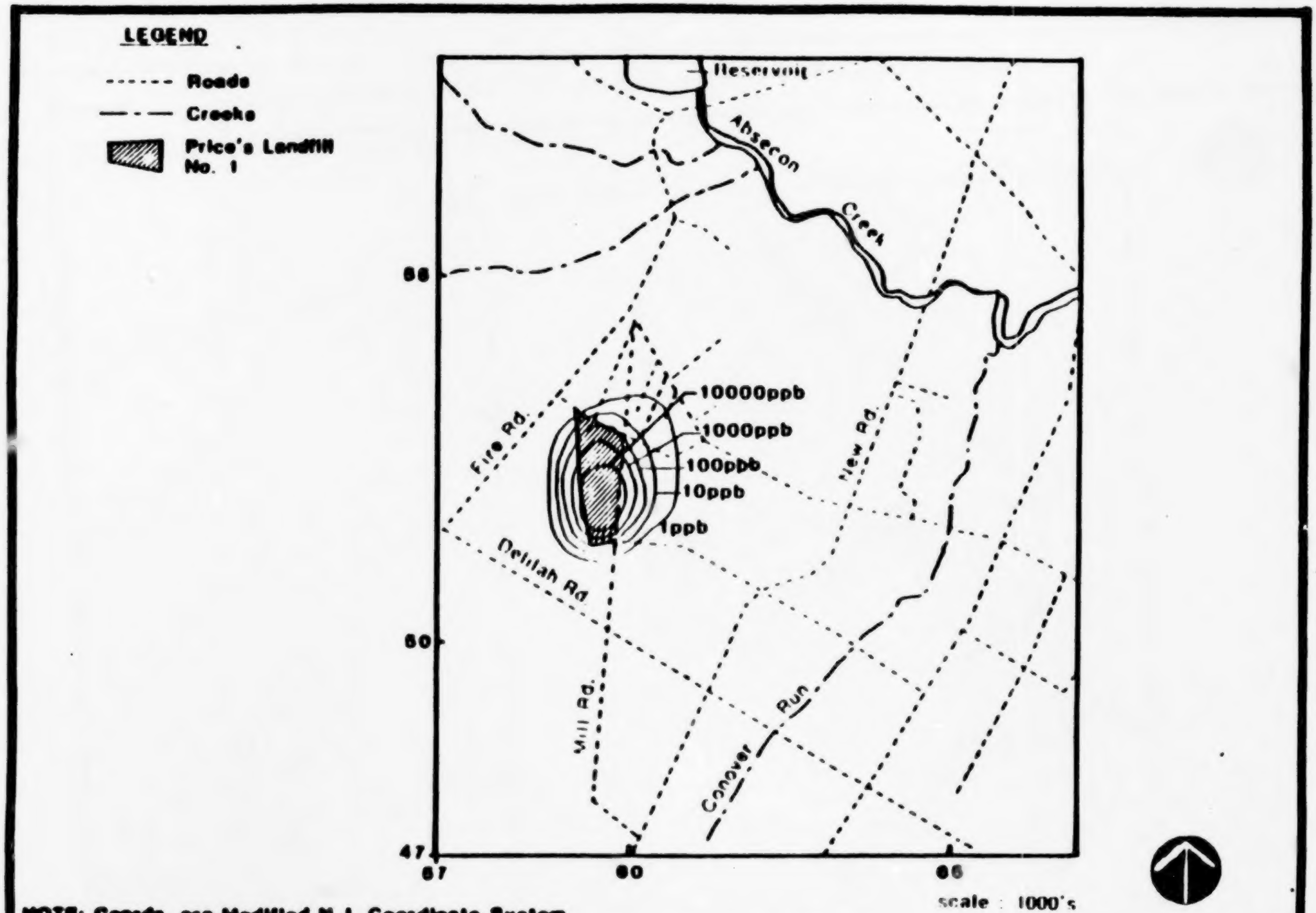
NOTE: Coords. are Modified N.J. Coordinate System

FIGURE 14 SLURRY WALL AND PUMPING ALTERNATIVE--CONCENTRATIONS AT LAYER 5 AT YEAR 5


LEGEND
Roads
Creeks
Price's Landfill No. 1
Reservoir
Absecon Creek
Fire Rd.
Delilah Rd.
Mill St.
Conover Run
New Rd.
10ppb
10ppb
1ppb
65
60
47
57
60
65
scale : 1000's

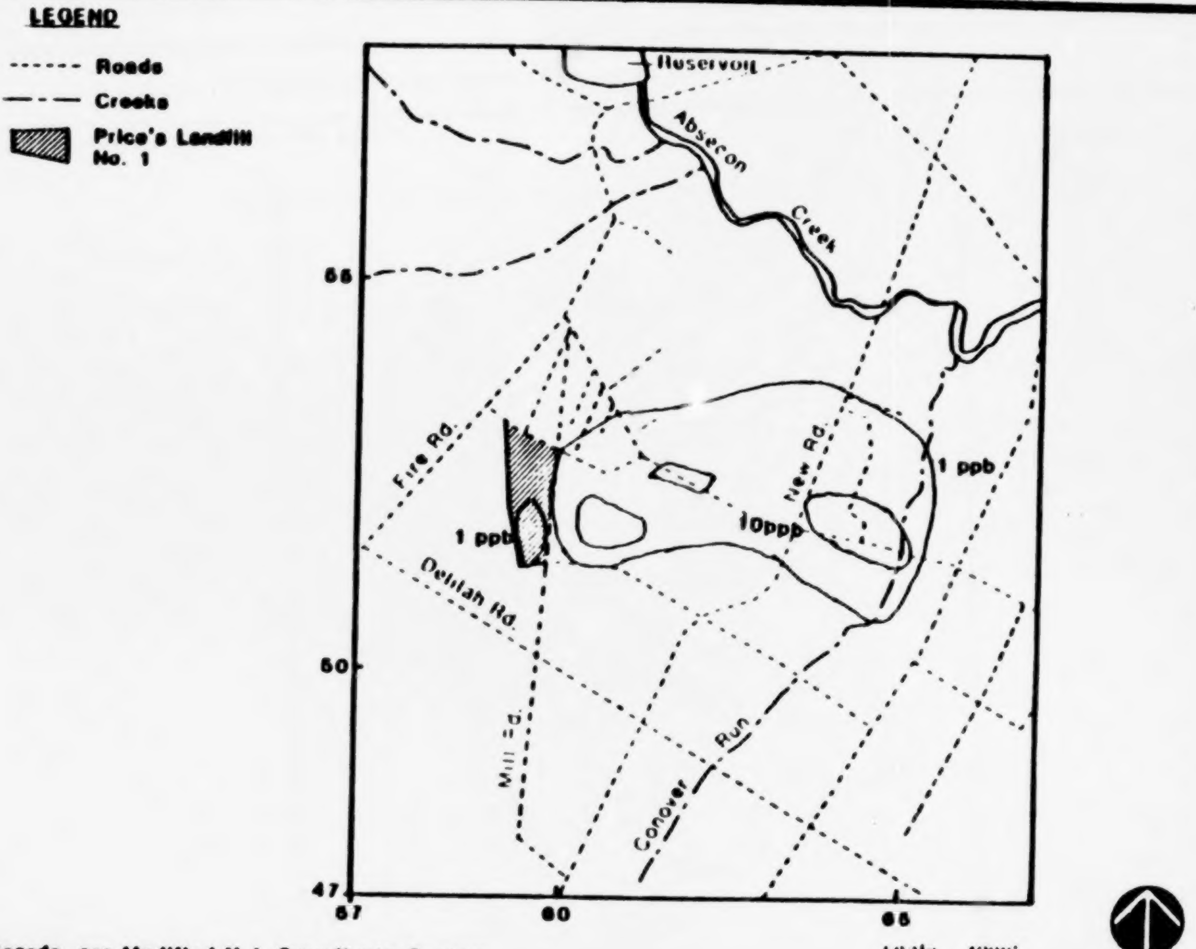
NOTE: Coords. are Modified N.J. Coordinate System

FIGURE 13 SLURRY WALL AND PUMPING ALTERNATIVE--CONCENTRATIONS AT LAYER 3 AT YEAR 5


LEGEND
Roads
Creeks
Price's Landfill No. 1
Reservoir
Absecon Creek
Fire Rd.
Delilah Rd.
Mill Rd.
New Rd.
Conover Run
10000ppb
1000ppb
100ppb
10ppb
1ppb
55
50
47
57
60
65
scale : 1000's

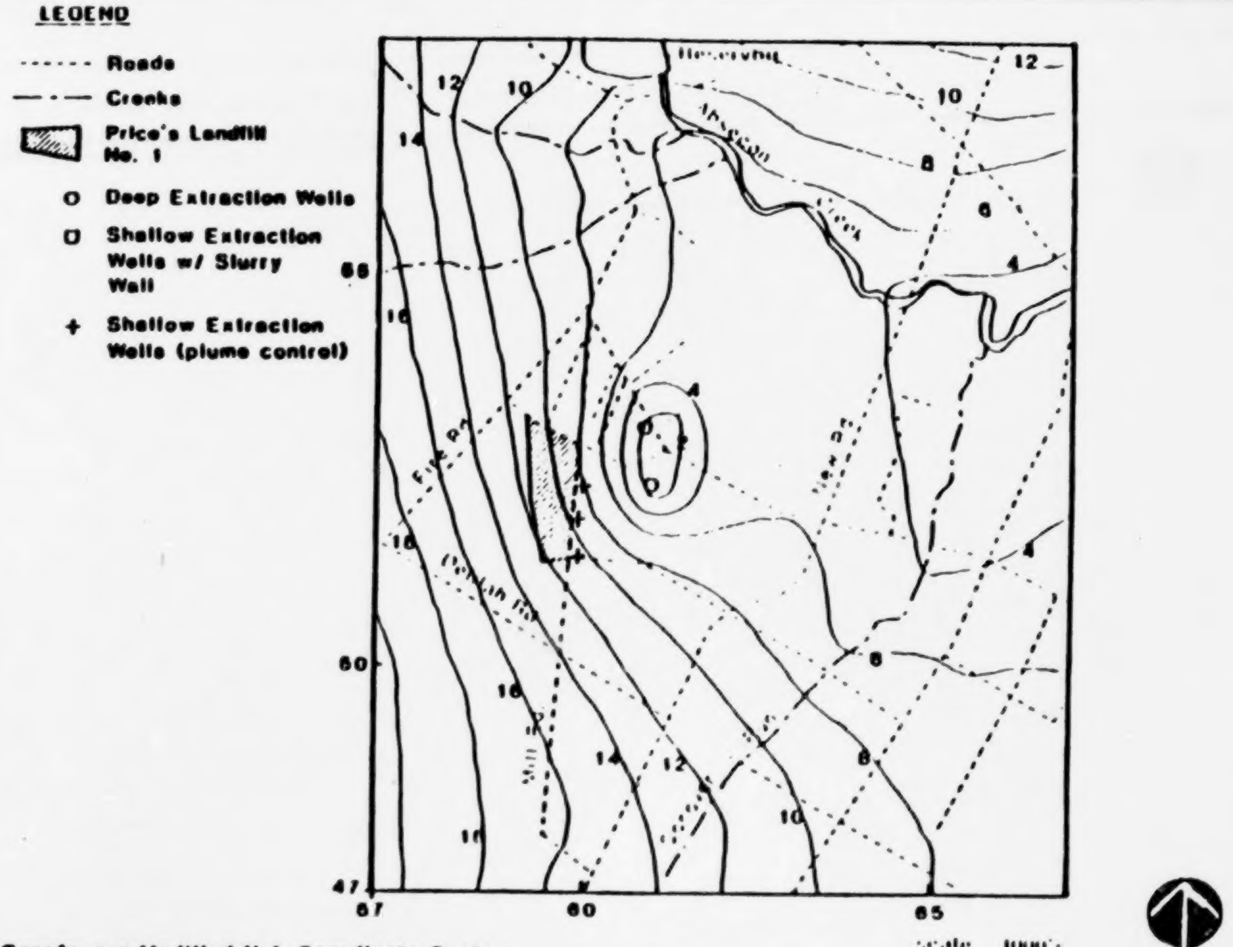
NOTE: Coords. are Modified N.J. Coordinate System

FIGURE 12 PLUME PUMPING ALTERNATIVE--CONCENTRATIONS AT LAYER 5 AT YEAR 20


LEGEND
Roads
Creeks
Price's Landfill No. 1
Reservoir
Absecon Creek
Fire Rd.
Delilah Rd.
Mill Rd.
New Rd.
Conover Run
1 ppb
10ppb
1 ppb
55
50
47
57
60
65
scale 1000's

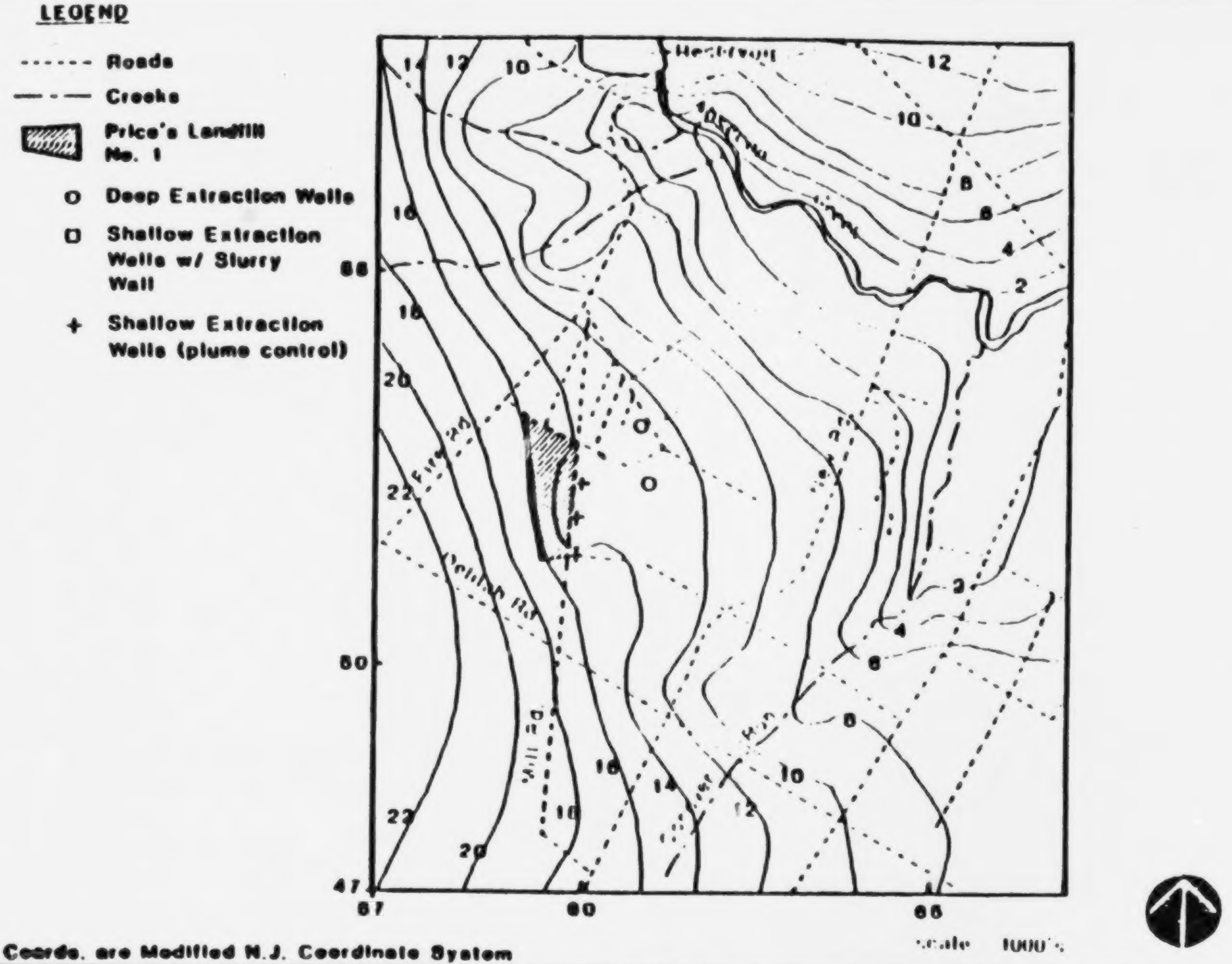
NOTE: Coords. are Modified N.J. Coordinate System

FIGURE 11 PLUME PUMPING ALTERNATIVE--CONCENTRATIONS AT LAYER 3 AT YEAR 6


LEGEND
Roads
Creeks
Price's Landfill No. 1
O Deep Extraction Wells
▢ Shallow Extraction Wells w/ Slurry Wall
+ Shallow Extraction Wells (plume control)
12
10
14
16
18
4
8
6
66
60
47
67
60
65
Creek

NOTE: Coords. are Modified N J. Coordinate System

FIGURE 10 PLUME PUMPING ALTERNATIVE--PIEZOMETRIC HEADS AT layer 3



LEGEND
Roads
Creeks
Price's Landfill No. 1
Deep Extraction Wells
Shallow Extraction Wells w/ Slurry Wall
Shallow Extraction Wells (plume control)
14
12
10
16
18
20
22
2
4
6
8
3
Mill Rd.
Delilah Rd.
Fire Rd.
68
60
47
67
80
88
Scale 1000's

NOTE: Coords. are Modified N.J. Coordinate System

FIGURE 9 PLUME PUMPING ALTERNATIVE--PIEZOMETRIC HEADS AT LEVEL 5

TABLE 8
PRESENT WORTH ANALYSIS WITH TREATMENT SYSTEMS*
AND ALTERNATIVES
($ x 1000)

Item	Chemical/Physical Treatment				Air Stripping/Lime Pretreatment				Lime Addition Pretreatment	
	(Total Flow)		(Partial Flow)		(Total Flow)		(Partial Flow)			
Plume Abatement										
Capital Costs	7,400		7,630		6,160		4,985		4,600	
O&M Costs										
1-5 yrs	1,860	2,206	1,965	2,320	1,122	1,470	950	1,297	768	1,116
6.. yrs	470	558	497	587	284	372	240	328	194	282
Present Worth @ 10% 25 yrs.	16,940	18,700	17,710	19,530	11,900	13,700	9,860	11,640	8,540	10,320
Containment Wall and Plume Abatement										
Capital Costs	12,390		12,650		11,150		9,980		9,9990	
O&M Costs										
1-5 yrs	1,943	1,307	2,055	2,424	1,173	1,537	992	1,356	803	1,167
6.. yrs	389	461	411	485	235	307	298	271	161	233
Present Worth @ 10% 25 yrs.	21,810	23,550	22,610	24,400	16,840	18,600	14,790	16,550	13,480	15,250

*Costs associated with onsite metal precipitation and sludge disposal. The low costs are associated with the disposal of a non-hazardous sludge while the high costs are associated with the disposal of a hazardous sludge. Monitoring costs were not included in these analyses. The present worth for monitoring was calculated as $420,000 the same for all options.

TABLE 9
PRESENT WORTH ANALYSIS WITH TREATMENT SYSTEMS[1] AND ALTERNATIVES[2]
($ x 1000)

	Air Stripping/Lime Pretreatment		Lime Addition Pretreatment
	(Total Flow)	(Partial Flow)	
PLUME ABATEMENT (Alternative #2)			
Capital Costs	4,860	3,870	3,190
Annual O&M Costs			
1-5 years	1,180	1,010	874
6...years	299	255	220
Present Worth @ 10% 25 yrs.	10,910	9,050	7,670
CONTAINMENT WALL WITH PLUME ABATEMENT (Alternative #3)			
Capital Costs	9,850	8,850	8,810
Annual O&M Costs			
1-5 years	1,236	1,055	915
6...years	247	211	183
Present Worth @ 10% 25 yrs.	15,850	13,960	12,620

[1] Costs are associated with the addition of lime, and metals removal, at ACUA.

[2] Plume Abatement wells are shut-off after five years.

Community Relations Responsiveness Summary

Completion of the Feasibility Study
Price Landfill
Pleasantville City and Egg Harbor Township
Atlantic County

Site History:

Price Landfill is a 26-acre site originally mined for sand and gravel. The site became a commercial landfill receiving municipal solid waste in 1969. In May, 1971, the landfill began to accept bulk and drummed liquid and solid chemical wastes. Available information indicates that these wastes included industrial chemicals, sludges, oils, greases and sewage. Total quantities dumped are estimated to be at least nine million gallons. Chemical waste disposal operations were terminated in November, 1972; sludge disposal was terminated in May, 1973 and municipal waste disposal was terminated in 1976. In December, 1982 the Price Landfill site was placed on the National Priorities List (NPL) by the United States Environmental Protection Agency (USEPA). Of 97 New Jersey sites on the NPL, this site ranks third.

Major Issues and Concerns and Related Remedial Activities:

Major issues and concerns have centered on the fact that considerable ground water contamination exists in the vicinity of Price Landfill. Among the contaminants present are benzene, cadmium, chloroform, dichloroethylene, lead, 1-2-transdichloroethylene, trichloroethylene, vinyl chloride and acetone. The ground water flow in the area of the landfill is complex, with three separate aquifer formations located within 150 feet from the surface. The plume of contamination extends almost one mile from the site and the contaminants tend to move in an east-northeast direction.

In 1980 residential wells in the area were found to have levels of total volatile organics exceeding 100 parts per billion (ppb) and the Atlantic County Health Department recommended that the residents discontinue using the water for drinking and cooking purposes. As an interim measure to provide an alternative water supply, 400-gallon "water-buffalo" tanks were provided for residential use. In December, 1981, 37 affected residences were connected to the New Jersey Water Supply Company source. The advancing underground contamination also threatened some of the wells supplying drinking water for Atlantic City, causing an immediate precautionary shut down of four of the Atlantic City Municipal Utility Authority's 12 wells.

In December, 1981, USEPA commissioned a contractor, Camp, Dresser and McKee (CDM), to prepare a two-part study addressing: 1) the immediate measures necessary to ensure a supply of uncontaminated water to affected communities for the summer of 1982 and 2) the long-term remedial solutions necessary to protect the water supply and to remediate the discharge of contaminants from the landfill.

During April, 1982, CDM issued a report outlining initial measures necessary to ensure the summer water supply: upgrading of the water treatment plant, the redevelopment of three production wells, installation of a water supply system interconnection, provision of standby carbon filter units and implementation of water conservation measures and a ground water monitoring program. These measures were successfully implemented.

In June, 1982 the Atlantic County Health Department and the New Jersey Department of Health conducted a health survey of the population living close to the landfill and in the direction of the ground water flow, most of whom were using or had used private wells as their only water supply. (The final report of this survey is attached as Appendix A.)

In June, 1983, CDM issued a second report summarizing its full investigative study. This study included development of computer ground water flow models designed to assess the movement of contaminants leaching from the landfill and an evaluation of ten remedial alternatives. This study led to the decision to relocate the Atlantic City Municipal Utilities Authority (ACMUA) wells. Construction was completed in December, 1985. From the ten remedial alternatives outlined in the study, four were selected for further investigation and the computer models were recalibrated to 1984 field conditions to predict the behavior of each of these alternatives. These four alternatives were studied in depth during a subsequent remedial investigation and feasibility study performed by CDM and are discussed in detail in the July, 1986 fact sheet (attached in Appendix B). The models were also used to evaluate the impact of the relocation of the ACMUA wellfield to its new location north of the Atlantic City reservoir.

Concerns upon release of the feasibility study report focused on implementation of the recommended alternative, water allocation, land use and health issues. A summary of comments and questions expressed at the July 15, 1986 public meeting with responses made by the New Jersey Department of Environmental Protection (NJDEP) follows on page 3. Copies of a resident's written comments and NJDEP's response are attached as Appendix C.

Comments on the feasibility study report have also been made by some of the defendants in U.S. v. Price, civil action number 80-4104, pending in the United States District Court for the District of New Jersey. Copies of these comments are attached as Appendices D and E. The defendants have raised concerns in that letter and the referenced writings about various technical aspects of the Feasibility Study report. We have responded to these concerns in writing as is evidenced in the attached Appendix F. We believe the defendants' concerns are not well-founded.

Community Relations Activities

The objectives of the community relations program are as follows: 1) to maintain lines of communication with local and other officials as well as involved citizens and to ensure public understanding of basic issues involved in the remedial program, 2) to inform officials, residents and other interested parties about the nature of the planned remedial action, to provide them with background material on the technical studies when requested and to receive citizen feedback on possible courses of action and 3) to provide a final summary of citizen concerns and problem areas and the governmental response to them. In accordance with these objectives, ongoing communication was maintained with the exception of the 16-month period during which U.S. Magistrate Jerome B. Simandle imposed a confidentiality ruling barring disclosure of the feasibility study to the public while settlement discussions were occurring with the allegedly responsible parties.

Local public meetings and briefings were held on the following dates:

December 1, 1981
April 6, 1982
May 4, 1983
December 20, 1983
April 19, 1984
July 15, 1986

Copies of meeting materials are attached as Appendix G.

Following is a summarization of the public's questions and comments to the NJDEP regarding the feasibility study and the responses to these.

Movement of the Plume/Nature of the Contaminants

1. How fast is the plume moving?

   A. There is a relatively slow movement downwards from the landfill through what is called the upper Cohansey plate (clay). Depending on the given location, it may take up to five years to penetrate that plate (clay). Once the plume got into the middle zone of the system (the lower section of the Upper Cohansey sand lens), it was moving fairly rapidly as long as the Atlantic City Municipal Utilities Authority (ACMUA) was pumping from that zone. When ACMUA shut off its pumping, the plume began to move much more slowly, but it is still moving at an average rate of 200 feet per year.

2. How can you tell which layers of water are going where?

   A. We have installed our ground water monitoring wells at various depths into the various layers of ground water. The intervals over which we collect the samples are between 10-20 feet. This makes the collection of the sample very specific as to the location we are looking at, enabling us to see clear, clean layers and dirty layers.

3. Are the heavy metals moving at the same speed as the organics?

   A. No. We are finding the heavy metals in closer to the landfill. They are probably being adsorbed by the clay of that upper lens.

4. What is the margin of error for ground water movement?

   A. Five hundred feet is a reasonably good estimate.

5. In the picture of where the plume would be in the future without treatment, it was past the Absecon Creek line. Will it go under Absecon Creek and continue on without stopping?

   A. We have a fairly dense network of monitoring wells in the plume and we have checked very carefully to determine whether the plume would go to the east of Conover Run or to the north of Absecon Creek. Under all conditions, the ground water models indicate that those streams are the discharge boundaries and they pretty much limit the extent of where the plume will go. There is a low-lying swampy area which bounds the Absecon Creek. We show the plume discharging into the swamp and, depending on the season of the year, the plume would sometimes move slightly to the north. For all practical purposes, we should assume the plume stops at the creek.

As far as moving downward and under Absecon Creek is concerned, in general, based on the regional ground water flow, the lower Cohansey system tends to discharge more to Absecon Bay than to Absecon Creek. As it approaches Absecon Creek, however, all of the ground water gradient in the Upper Cohansey system reverses and you get flow back to the surface.

6. We have been told there is an impermeable layer of clay below which the water will not go. What is driving the plume below this layer?

   A. There is a clay layer that underlies the lower Cohansey system and exists between that system and the Kirkwood Formation. This clay layer is agreed by all to be reasonably impermeable and there would probably be very little movement through it. We definitely have movement downwards through those clay layers that exist above the clay layer between the lower Cohansey system and the Kirkwood plate. They are relatively thin (approximately 30 feet thick) and are not impermeable.

7. I am not sure you have really identified all the volatile materials in Price's Pit. Some of the drums that have not been opened up yet may contain entirely new surprises and you may not be able to discharge them. What are you going to do with organics like PCBs which do not respond to air stripping or to activated carbon? How are you going to get rid of them? Dump them out in the ocean?

   A. We feel the recommended treatment system will work effectively for the contaminants we have discovered at the landfill to date. We will continue sampling every three months for an estimated duration of twenty years and if we discover something new, we will modify the treatment system to handle it.

Technical Aspects of the Remedial Alternatives

8. Why can't the treated water be re-injected or discharged on the ground for water table replenishing? Can't we have our own closed-circuit system rather than to keep on pulling water out? Why can't that water be used for irrigation purposes or to water people's lawns? It must be clean enough if you have considered discharging it to Abescon Creek. Is it potable or anywhere near potable? Will there be heavy metals in it?

   A. Technically it is possible to do what you suggest. There are, however, very few systems where reinjection has worked consistently well with shallow ground water. One problem here is the amount of iron in the water. We would have to be very certain that we remove all the iron prior to reinjection or we would clog up the area of the aquifer where the water is being reinjected. In addition, there are a lot of technical and financial problems with reinjecting the water into the Cohansey Sands. If the extracted ground water were either reinjected or discharged on the ground surface this could create additional problems with regard to a discharge location, treatment, and additional monitoring and control devices. These additional considerations would be more costly than the selected alternative and would require more sensitive monitoring. Using this water for irrigation purposes would require either additional treatment or a new distribution system only for this treated water. Either of these solutions would be cost prohibitive.

9. I am concerned about removal of vast amounts of water from this area and the fact that, at the same time, the sources that feed our aquifers are starting to dry up. What is going to happen to our water table? Is the water table going to start lowering so that people's wells will start drying up? Are we going to start getting salt water intrusion into our aquifers? Who is going to start studying the problem of water allocation at one coordinated time?

    A. Camp Dresser and McKee's ground water modeling work has shown no change in the water level elevations in the lower zone that we are planning to pump. The water in the upper zone will be lowered. However, this a restricted zone and no one should be extracting water for potable use in this zone. And actually, there is a large flow of water from west to east in the Cohansey Sand system in this area, a lot of which is discharged to Absecon Bay every day and is not used. But in terms of continued development, there is a potential problem and it has to be addressed as ground water management on a regional scale.

10. Have you considered the impact of your draw-down within a half-mile or mile radius of your deep wells and how it will impact on other wells in the area?

    A. There is no draw-down from any of the extraction wells outside of our existing plume area.

11. Would it be possible to coordinate with the resource recovery plant the county has proposed to build nearby and use the treated water to cool the plant and then discharge it to the Atlantic County Utilities Authority (ACUA) sewage plant?

    A. It is possible. If the ACUA is interested in using this pretreated water the DEP will entertain these discussions.

12. Will the ACUA sewage plant be able to handle the additional volume of treated water that would be coming from this project? Are they preparing now to accept this extra volume?

    A. We have discussed the ability of ACUA to handle the additional volume with the ACUA and with the Industrial Pretreatment Section of the DEP's Division of Water Resources. They feel the facility can handle the quantity of water we are proposing to send there as well as the concentrations of contaminants that are in the water. ACUA is in a design phase now to upgrade it's facility. We have been assured that this will not be a problem and we are negotiating with ACUA for a service agreement to accept this waste.

13. I am concerned about sewer main capacity. Through what lines will this water be sent to the plant? Where will the pumping stations be?

    A. The actual route is something we will address in the next stage of the remedial action program, which is the engineering design to implement the selected remedial alternative. When the conceptual design report is available, we will send a copy to the Mayor to be made publicly available. At this time the DEP is proposing to construct a new force main to transport the water to an existing ACUA interceptor line. From this intercepter line the water will flow to the Pleasantville Pump Section where it will be conveyed in an existing force main to the ACUA plant in Atlantic City.

14. What data do you have on the effluent coming out of the ACUA at the end of the process? How would the addition of 1,200,000 gallons per day change the water quality of the effluent as it leaves the treatment plant and goes into the ocean?

    A. Actually we are sending a very dilute waste stream to the plant and ACUA will be required to discharge at existing permit conditions. We would not want them to exceed those conditions. Based on the Bio-Treatability Study that was performed by CDM we do not anticipate that our wastes will cause any problems with ACUA effluent.

15. The Atlantic County Utilities Authority (ACUA) as it is presently operating has frequent air pollution problems. How would this additional effluent impact on that existing problem?

    A. The effluent from this project shouldn't have any impact on the odors. The ACUA is currently in the process of upgrading its facility to handle any difficulties it is currently having and is proposing to upgrade the facility to accept additional water.

16. If and when you do hook up to the ACUA sewage plant will your treatment of this contamination be consistent over each month or will it double up over the summer as our resort sewage doubles during the summer since you have to have percentages of compatibility?

    A. The volume of water that we plan to pump to ACUA will be constant each month. Our Bio-Treatability study showed that if our waste were a relatively high percentage of the total waste ACUA receives, there should be no problem with ACUA operations.

17. How much will it cost to put in a new line to feed the line that goes to the ACUA? How much will it cost to upgrade the facility? Taking into consideration the cost, wouldn't it be worthwhile to re-inject that water?

    A. The estimated cost of constructing a means of conveying the waste to ACUA is $495,000. This is considerably less than the additional cost to construct and operate an on-site treatment plant that would allow reinjection of the water back into the ground. The cost of upgrading ACUA's facility is not fully known.

18. Was biodegradation on-site ever looked into?

A. Yes, however because of the complex nature of the contaminated waste water, and the long retention times, on-site biodegradation was not considered as a viable secondary treatment option. This method works very well when you have a spill of one chemical.

19. Does the air stripping really work?

A. Yes, based on the Bench Scale Air Stripper column that CDM used and existing available data on air stripping, we are estimating over a 90% removal rate with the air stripper. This process will also meet state requirements and operate with a permit.

20. Can you or can't you install a containment wall?

A. The problem is that in most cases where you try to establish a containment wall, there is a reasonably good impermeable layer of clay which is going to form the bottom of the containment system. At Price's Landfill, the first clay which is consistent enough to be a reasonably impermeable barrier is the Cohansey Clay which at the landfill site is down about 150'. It is pushing the present technologies to install a slurry wall down 150' and still be able to get it to be reasonably impermeable. We would also have to extract very large quantities of material which would be very heavily contaminated and which would release very large quantities of volatile organics during construction.

There is another option which is to install a hanging slurry wall which would go down roughly 80' and penetrate the upper Cohansey Plate (clay) forming something like an upside down bathtub. We would then pump water from inside the wall and force water up through the landfill, treat it and discharge it to ACUA. Our estimates are that we would have to pump around 150,000 gallons a day to insure that we had an upward positive gradient into such a system. That's not much less than what we have to pump just outside the landfill to control the plume. With both of these we would probably have to spend between $5-$8 million for a relatively minimal increase in protection and a very small reduction in the amount of water we would pump.

21. Will there be any attempt to exhume any of the drums that are presently in the ground? I bring this up because many chlorinated solvents, in particular, are not corrosive at all and the drums are going to erode from the outside in rather than from the inside out. It would seem to be a good time to go in there and get them out before they start polluting the ground water.

A. The drums have been there now for about 15 years and there is no record of any systematic drum disposal at Price Landfill. Because of the length of time these drums have been buried, it is unlikely that large quantities of intact drums still remain. Remote geophysical technologies would not be able to reliably distinguish drums from other buried metallic objects. Any type of direct identification of drums, such as excavation, would be extremely hazardous and would not be practical nor cost effective. We would be hunting random drums and the probability of getting any significant number out without breaking them and discharging volatile organics into the air is very small. The judgement is that it is better to leave the drums in place and no attempt will be made to exhume any buried drums. The proposed remedial plan will capture contaminants at a location directly adjacent to the landfill.

22. What is the ultimate fate of the heavy metals that you are going to take out? I am especially concerned about cadmium.

    A. The heavy metals would be transported to ACUA and be removed in the solids processing at the facility as a metal hydroxide sludge.

Related Questions

23. Are the responsible parties contributing to the cost?

    A. The Department of Environmental Protection and the United States Environmental Protection Agency have reached a tentative settlement agreement with some of the potentially responsible parties. The amount of this settlement is approximately $17.15 million and should cover the cost of the proposed remedial plan.

24. Request for sampling results from Delilah Road Landfill.

    A. The Remedial Investigation/Feasibility Study for the Delilah Road site is currently underway. Sampling results are not available yet but will be sent to you when they are. Also, the DEP will hold another meeting like this one when that full project is completed.

25. Obviously there is some danger in the chemicals to be extracted by the treatment system. What happens to the chemicals that are already escaping? What danger is caused to people living in the area?

    A. We have not identified any problems from Price Landfill other than that of using the contaminated ground water for potable purposes. The chemicals in the ground water are not causing problems via other routes of exposure, for example, air contamination. The chemicals that are extracted by the treatment system will be condensed and collected, either in a concentrated liquid form or in vapor phase carbon. Any emissions to the air will be within the standards established by the NJDEP Administrative Codes which regulate air emissions.

26. Does everything that has been said apply to the area bordered by Mill Road, Spruce Street, Delilah Road and Fire Road? Is that area also going to be cleaned up? When you start cleaning up and chemicals are in the air, what is going to happen then?

    A. What we have discussed does apply to that area. We will take precautions to reduce and control air emissions. We will be required to monitor these emissions and keep them below limits established by NJDEP Administrative Codes.

27. I have lived on California Avenue for 30 years and I have never had to water the grass. Now it is brown -- what has happened? Are we drawing all the water from the earth? Is the poison coming up through the earth?

    A. You should contact your local county agriculture agent to inspect your grass and determine the cause of the problem. Actually the plume is between 15' to 100' below the surface and would not be making the grass brown. More likely, it could be because we have not had enough rain.

28. We are often told that everything is going to be all right and then find out five years later that it didn't work. On television I saw other contaminated areas being tested and I have never had anyone bring any kind of machinery into my house to test the air the way I have seen on television. Why?

    A. Based on the air monitoring that we have done on site we have not identified any air problems due to the contaminants present at the site.

29. I am bitter because I think we should have been told the water was contaminated sooner, before we drank it.

    A. As soon as the problem of contaminated water was identified, a temporary water supply, in the form of National Guard "water buffalos" was provided. Sometime later, the New Jersey Water Company was ordered to extend their water lines and the affected homes were hooked up to a public water supply.

30. So far nobody knows how bad we have been hurt already.

    A. We will try to arrange for someone to come here to talk with you about your health concerns.

Appendix A

REPORT

A Health Survey of the Population Living
Near the Price Landfill Conducted By
The Environmental Health Hazard Evaluation Program,
New Jersey State Department of Health
in Cooperation with
The Atlantic County Health Department

July 1983

A HEALTH SURVEY OF A POPULATION LIVING NEAR THE PRICE LANDFILL, EGG HARBOR TOWNSHIP, ATLANTIC COUNTY

Price Landfill is located on the western side of Mill Road between Delilah and Spruce Street in Egg Harbor Township, Atlantic County. The 26-acre site was licensed by the New Jersey Department of Environmental Protection (DEP) in 1972 as a sanitary landfill to accept municipal, bulky waste, vegetative, animal and food, junk, auto, and non-chemical industrial waste. Operations ceased in September 1980, and the site is now closed and inactive with a final cover, although some debris can be seen and erosion with leachate is present on the western edge of the site. The landfill mass rises to about 40 feet above the mean ground elevation, with shallow groundwater 20 feet below in a permeable sandy soil.

According to the Solid Waste Administration files at DEP, an estimated five to six thousand fifty-gallon drums and unknown amounts of bulk liquid chemical wastes were accepted at the site. In a period from April 10 to May 7, 1972, 82,000 cubic yards and 2,968 drums of various chemical wastes were accepted. Open chemical dumping went on for nearly four years.[1]

Contamination of both private and public wells has been established by the U.S. Environmental Protection Agency (EPA), DEP and the Atlantic County Health Department. Both organic and inorganic contaminants have been found in monitoring wells. Samples exceeded Water Quality Criteria (WQC) established or recommended by EPA, in some cases by many thousand times, for substances such as cadmium, beryllium, lead, zinc, nickel, bis (2 chloroethyl) ether, chloroform, tetrachloroethylene, vinyl chloride, benzene, 1,2 dichloroethane, methylene chloride, toluene, trichloroethylene and many more.[2]

[1] New Jersey Department of Environmental Protection-Hazard Management Division Price Landfill Site Inspection Report, January 5, 1981.

[2] USEPA Price Landfill analytical results, June 10, 1980 and September 23, 1980

Generally, these substances are poorly degraded by natural processes and tend to persist in the environment. These compounds are known to be toxic. Research to identify adverse health effects from exposure to low concentrations of these chemicals is necessary. Concern over this contamination led the Atlantic County Health Department and the New Jersey State Department of Health to conduct a health survey of the population living close to the landfill and in the direction of the groundwater flow, most of whom were using private wells as their only water supply.

Some 50 homes lie in the study area which covers a sector up to about 1½ miles to the north and northeast of Price Landfill. (Hydrogeologic studies determined that the groundwater flows north and northeast below the landfill.) When the wells of some of these homes were tested in 1980 and found to have levels of total volatile organics exceeding 100 ppb, the Atlantic County Health Department recommended that the residents discontinue using the water for drinking and cooking purposes. DEP ordered the water company to provide lines and by late 1981, the pipes were installed. As of the summer of 1982, 22% of the participating surveyed residents were still using private well water.

The survey consisted of a questionnaire administered to each member of the household to gather information on exposure to toxic substances, the presence of symptoms and reported medical problems. In addition, this questionnaire was administered to a control group of residents living several miles away from the landfill who had always been on a municipal water supply. The control households were from a similar type of housing in the same county. The information was analyzed to determine whether or not health symptoms were more prevalent in residents living near the landfill on private water supplies.

METHODS

The data for the present analysis are from a cross-sectional study of reported symptoms and illness in the population residing in the area of suspect or proven groundwater contamination to the north and northeast of the Price Landfill compared to another population residing in another part of Atlantic County using a public water supply. Maps of the surveyed area are shown on pages 9 and 10. The analyses of relative risks were done separately by sex and water usage. First, all the exposed population versus the unexposed population was examined. Then, those individuals still using private well water for drinking, cooking, washing and bathing were compared to the unexposed population. Former users of private well water now using municipal water for drinking, cooking, washing and bathing were also compared to the unexposed population. In addition, analyses were done for physician visits and frequency of complaints. The questionnaire used is shown in Appendix A.

RESULTS

The sample sizes, the proportion of households successfully interviewed, the distribution by sex, age, tobacco use and/or chemical exposure and the perception of taste in the water are shown in Table I. Differences between the exposed and unexposed populations are small with the exception of the number of vacant households and those bothered by the taste of the water. Twenty-seven percent of the exposed homes were vacant compared to eight percent in the unexposed. Forty-six percent of the exposed compared to five percent of the unexposed were bothered by the taste of their water.

The data presented in Table II are tabulated relative risks of complaints in the exposed population compared to complaints in the unexposed group. A relative risk greater than one (1) indicates that the risk of the specific symptom is greater in the exposed population. An asterick (*) by a relative risk indicates a statistically significant risk at the 5% probability level.

Muscle pain was the only significant complaint reported at all levels of frequency either daily, weekly, monthly or seldom in the exposed Price males, whereas the exposed Price females reported rash, skin irritation, joint pain, nausea and abdominal pain significantly more often. The same is true for those currently on well water. Exposed females using well water at the time of interview reported more eye irritation, rashes, tiredness, muscle pain and nausea. Exposed males using well water at the time of the interview did not report any complaints that were statistically significant. Overall, the exposed females reported more complaints than the males and the exposed population living in the survey area near

Price's Landfill, as a whole, reported more complaints than those in the unexposed group on public water supply several miles away. The actual numbers and percentages for the various symptoms are shown in Appendix B.

Table III presents the reported medical problems for both the exposed population and the unexposed control population by complaint, number of cases, and percent of total respondents. No particular complaint or medical problem was outstanding and both populations were quite similar in this analysis.

Table IV is a summary of pregnancy problems as reported by exposed and unexposed females. Fifty-two of the sixty-four exposed females and fifty-one of the seventy-two unexposed females responded to this question. As with the analysis of medical problems, nothing was outstanding with pregnancy problems, although a slightly higher percentage of exposed females reported a variety of problems.

SUMMARY

It is known that the groundwater flowing beneath the Price Landfill moves in a north and northeast direction. We also know that there were forty-one occupied homes in the study area within one and a half miles to the north and northeast of the landfill and that this was believed to be the extent to which the plume of groundwater contamination had spread, all of this at the time of our survey during the summer of 1982.

What we do not know is the exposure that each individual may have had. There is no data available on a complete sampling program of private wells. Some respondents may have had high levels of exposure to various contaminants and other respondents may not have had any exposure. What we have referred to as the exposed population certainly reported more symptoms than the control population which used a public water supply assumed to be free of the substances found in the groundwater below Price Landfill. However, there was no increase among the exposed population in chronic health problems or adverse reproductive outcomes.

The majority of exposed respondents were hooked up to a newly installed water supply some months prior to our survey. The number and frequency of symptoms are beyond what one expects based on the known toxicity of the comparatively low levels of chemicals found. What the exact role stress or increased concern about one's health as a consequence of knowing about the water contamination plays is unknown. The same questionnaire has been administered to an "exposed" and "non exposed" group of individuals in another part of New Jersey where water contamination was initially suspected (Somerset County). The results from that study are similar to the ones found at Price's Pit, in that the "exposed" group also has an increased number of reported symptoms. After reviewing the water data, however, the "exposed" group in Somerset County was found not to have any water contamination. It is interesting to note the same increase in reported symptoms among individuals that thought their drinking water was contaminated with that found in individuals who do have low level contamination of their water. The similarity of these results suggests that increased concern or stress may be a more important factor in the etiology of health complaints among individuals with low level water contamination than previously considered.

The actual etiology of the increased symptoms in a practical sense may not really be that important. After drinking water contamination is found, individuals are instructed not to use the contaminated water and are provided with alternate forms of water to prevent the possible long term potential chronic effect of continued exposure. This substitution of non contaminated water should alleviate the symptoms whether they are of toxicological or psychological origin. We are reassured by the absence of increased chronic health effects or adverse reproductive effects. With the low levels and comparatively short duration of exposure, we feel that the risk in the future of developing increased chronic health effects from the past exposure to the contaminated water is extremely unlikely. Individuals who do have persistence of symptoms should seek medical consultation with their personal physician as they may have some undiagnosed medical condition causing these problems.

In conclusion, we see no long term adverse health outcomes developing in residents living adjacent to Price's Pit as a consequence of their drinking water formerly being contaminated. The increase in reported symptoms can be attributed to some combination of toxicological and psychological factors. The provision for a clean water supply should alleviate these symptoms. Future work which would include a followup questionnaire to assess the expected remission of symptoms is being considered.

TABLE I

PRICE STUDY DISTRIBUTION OF POPULATION SURVEYED
EXPOSED AND UNEXPOSED

	EXPOSED POPULATION TO PRICE'S LANDFILL	UNEXPOSED POPULATION TO PRICE'S LANDFILL
Total Sample Size Of Households	56 (100%)	53 (100%)
Respondent Households	38 (67.9%)	40 (75.5%)
Non-Respondent Households	18 (32.1%)	13 (24.5%)
	15 Vacant (26.8%) 3 Refusals (5.3%)	4 Vacant (7.5%) 9 Refusals (17.0%)
Sex		
Male	57 (47.1%)	51 (41.5%)
Female	64 (52.9%)	72 (58.5%)
Total Respondents	121 (100%)	123 (100%)

AGE	Male	Female	Total	Male	Female	Total
0-9	7 (12.3%)	6 (9.4%)	13 (10.7%)	13 (25.5%)	11 (15.3%)	24 (19.5%)
10-19	16 (28.1%)	15 (23.4%)	31 (25.6%)	11 (21.6%)	14 (19.4%)	25 (20.3%)
20-59	24 (42.1%)	30 (46.9%)	54 (44.6%)	23 (45.1%)	38 (52.8%)	61 (49.6%)
60+	10 (17.5%)	13 (20.3%)	23 (19.1%)	4 (7.8%)	9 (12.5%)	13 (10.6%)
Total	57 (100%)	64 (100%)	121 (100%)	51 (100%)	72 (100%)	123 (100%)

Tobacco Use and/or Chemical Exposure	Male	Female	Total	Male	Female	Total
Yes	25 (43.9%)	13 (20.3%)	38 (31.4%)	19 (37.3%)	21 (29.2%)	40 (32.5%)
No	32 (56.1%)	51 (79.7%)	83 (68.6%)	32 (62.7%)	51 (70.8%)	83 (67.5%)
Total Respondents	57 (100%)	64 (100%)	121 (100%)	51 (100%)	72 (100%)	123 (100%)

Bothered By Taste				
Yes	56	(46.3%)	6	(4.9%)
No	65	(53.7%)	117	(95.1%)
Total Respondent .	121	(100%)	123	(100%)

TABLE II

PRICE STUDY RELATIVE RISKS OF REPORTED SYMPTOMATOLOGY
(ALL COMPARISONS ARE MADE TO THE APPROPIRATELY MATCHED CONTROL GROUP.)

WATER USE BY SOURCE SEX, AND FREQUENTCY OF COMPLAINTS (ALL RELATIVE RISKS ARE AGE-ADJUSED)	# EX-POSED	YES	EYE IRRI-TATION	NASAL IRRI-TATION	RASH	SKIN IRRI-TATION	TIRED-NESS	JOINT PAIN	MUSCLE PAIN	NAU-SEA	DIAR-RHEA	LOSS OF APPE-TITE	WGHT. LOSS	ABDOM-INAL PAIN	OTHER	MED-ICAL PROB-LEMS	PREG-NANCY PROB-LEMS
PRICE FEMALE	64	Bothered	2.02	0.93	4.12*	7.13*	1.47	2.27*	1.79	3.18*	1.18	1.94	2.17	2.79*	1.55		
	64	Freqently Bothered	2.28	2.29	6.06*	4.33	2.75*	3.62*	1.29	3.95	1.08	1.92	1.69	1.60	1.65		
	64	Saw Physician	0.40	0.69	1.74	3.35	1.49	1.26	0.80	1.66	1.06	1.76	1.97	1.39	1.37	1.15	2.09
PRICE MALE	57	Bothered	1.87	1.48	2.04	2.46	1.99	2.35	8.19*	2.23	2.65	2.41	1.13	2.49	3.03		
	57	Frequently Bothered	2.34	14.74*	2.72	3.06	2.39	3.29		1.29	0.66	7.80*		3.37			
	57	Saw Physician	1.18	0.72	0.82	1.62	0.93	1.33				2.23	0.0	4.09	0.75	0.62	
PRICE MALE & FEMALE	121	Bothered	1.96*	1.11	3.04*	4.21*	1.67	2.12*	2.16*	2.78*	1.45	2.44*	1.71	2.79*	1.74		
	121	Frequently Bothered	2.36*	3.24*	4.17*	3.62*	2.61*	3.19*	1.25	2.51	0.90	4.06*	2.28	2.66	2.64		
	121	Saw Physician	1.00	0.68	1.26	2.46	1.21	1.11	0.87	1.68	1.41	2.18	1.32	1.85	1.17	0.86	
CURRENT FEMALE USERS PRIVATE WELL WATER*	14	Bothered	3.99*	2.05	11.32*	2.72	3.66*	2.41	4.36*	3.76*	0.28	3.54	0.00	2.74	0.00		
	14	Frequently Bothered	4.44	8.75*	8.80*	0.00	6.38*	4.25	1.12	0.00	0.00	4.50	0.00	0.00	0.00		
CURRENT MALE USERS PRIVATE WELL WATER*	13	Bothered	1.25	0.49	0.30	0.41	0.60	1.48	2.58	0.57	2.40	3.14	1.26	0.48	2.22		
	13	Frequently Bothered	1.10	4.16^{x}	0.00	0.00	0.59	0.86		0.00	5.00	15.00^{x}	0.00	1.61	0.00		
FORMER FEMALE USERS PRIVATE WELL WATER*	47	Bothered	1.61	0.72	3.24*	9.32*	1.14	2.23	1.34	2.86*	1.52	1.89	2.91*	2.92*	1.87		
	47	Frequently Bothered	1.53	1.57	3.84	6.40*	2.13	3.27*	1.36	4.98*	1.32	1.87	1.91	2.51	2.02		
FORMER MALE USERS PRIVATE WELL WATER*	43	Bothered	1.82	1.96	2.91*	3.51*	2.66*	2.40	11.36*	3.01	2.84	1.90	1.00	3.09*	2.83		
	43	Frequently Bothered	2.29	14.64*	3.82	4.01	3.14*	4.30*	0.00	1.71	0.00	4.73		3.32			

TOTAL EXPOSED = 121	Bothered = Positive report regardless of frequency (daily, weekly, monthly, and seldom)
TOTAL UNEXPOSED = 123	Frequently bothered = Frequent complaints (daily or weekly)

x = Crude Rate

* (Three females and one male did not respond to water usage question at interview)

TABLE III

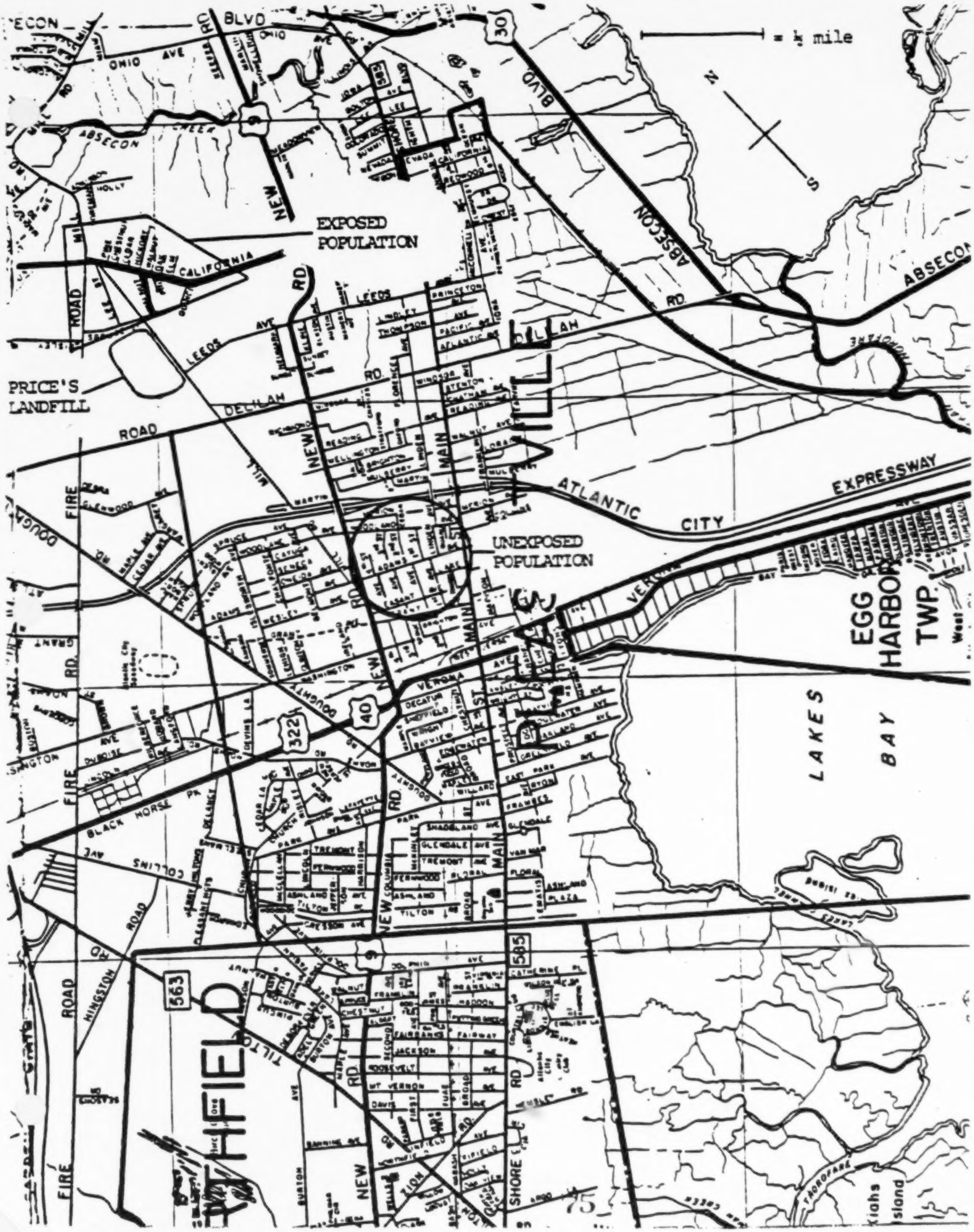
PRICE STUDY
REPORTED MEDICAL PROBLEMS
FOR
EXPOSED AND UNEXPOSED POPULATIONS

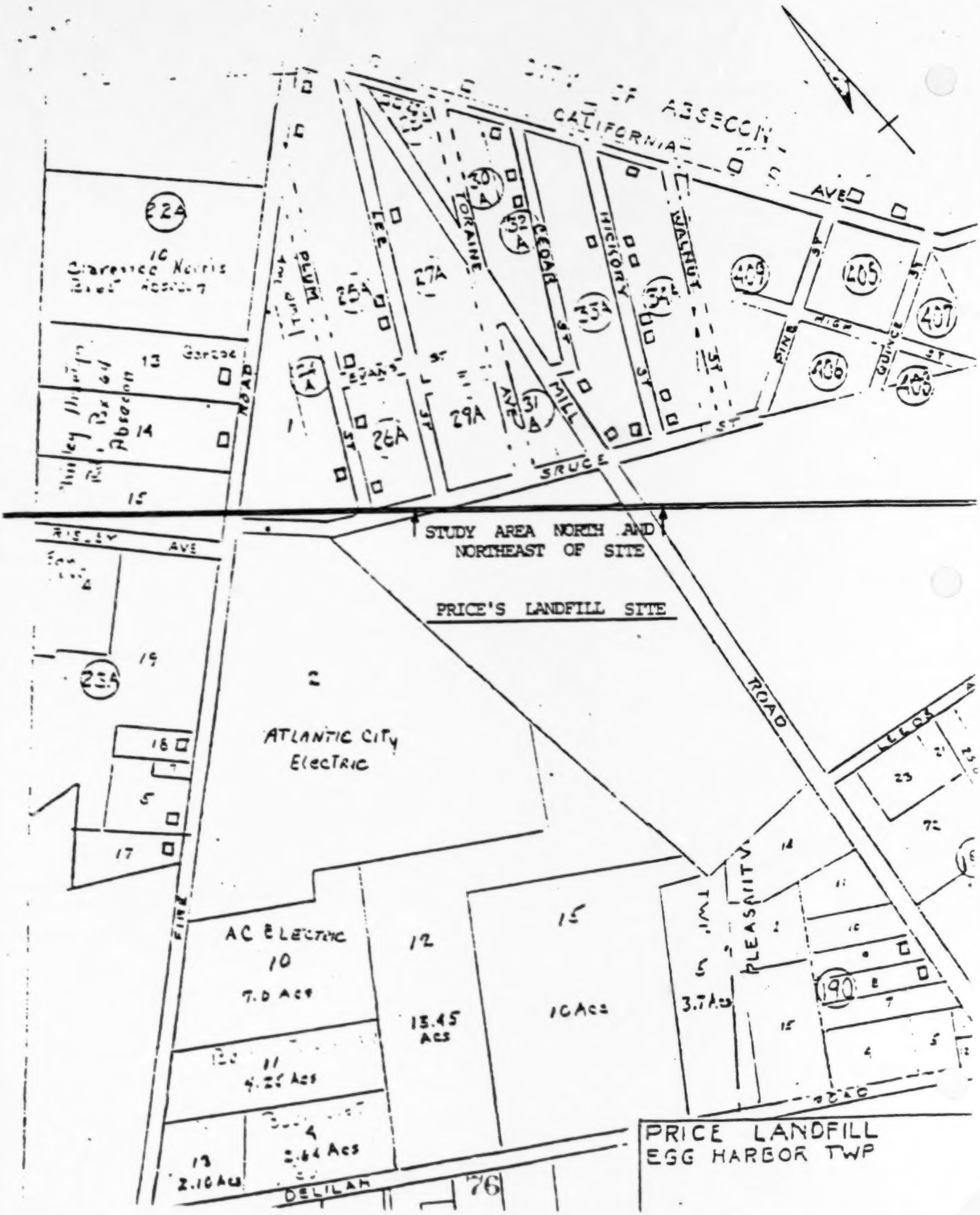
Medical Problem	Exposed - 121		Unexposed - 123	
	#	%	#	%
Thyroid Problem	1	0.8	-	-
Hypertension	7	5.8	7	5.7
"Back Problems"	1	0.8	1	0.8
Dermatitis	1	0.8	2	1.6
Edema	1	0.8	-	-
"Sarcoidosis"	1	0.8	1	0.8
Arthritis	7	5.8	9	7.3
Diabetes	3	2.5	4	3.3
Heart Problem	3	2.5	2	1.6
Hiatal Hernia	1	0.8	-	-
Allergies	3	2.5	6	4.9
Asthma	2	1.7	1	0.8
"Orange Peel"	1	0.8	-	-
Eye Problem	2	1.7	-	-
Cholycystectomy	1	0.8	-	-
Bronchitis	1	0.8	3	2.4
Seizure Disorder	1	0.8	-	-
"Bowel Problem"	1	0.8	1	0.8
CVA	1	0.8	2	1.6
Ulcers	-	-	3	2.4
Gallstones	-	-	1	0.8
Tumors	-	-	1	0.8
Glaucoma	-	-	2	1.6
Eczema	-	-	2	1.6
Anemia	-	-	1	0.8

TABLE IV

PRICE STUDY
REPORTED PREGNANCY PROBLEMS IN EXPOSED AND UNEXPOSED AREAS BY NUMBER AND PERCENT

PREGNANCY PROBLEM	EXPOSED AREA RESPONDING - 52		UNEXPOSED AREA RESPONDING - 51	
	#	%	#	%
Unable to Conceive	1	1.9	-	-
C-Section	2	3.8	1	1.9
"Large Birth"	1	1.9	-	-
"Pains"	1	1.9	-	-
No Description	1	1.9	-	-
Toxemia	-	-	1	1.9
Tumor	-	-	1	1.9
Miscarriage	1	1.9	1	1.9
TOTAL	7	13.5	5	9.8


= ½ mile
N
S
EXPOSED POPULATION
UNEXPOSED POPULATION
PRICE'S LANDFILL
ABSECON BLVD
ABSECON
ABSECON CREEK
30
9
40
322
585
563
NEW RD
MAIN
SHORE RD
DELILAH ROAD
LEEDS AVE
FIRE ROAD
BLACK HORSE PK
ATLANTIC CITY EXPRESSWAY
VERONA
CALIFORNIA
OHIO AVE
TILTON
LAKES BAY
EGG HARBOR TWP.
VILLE
HFIELD


CITY OF ABSECON
CALIFORNIA AVE
224
10
Clarence Norris
13
14
15
Garage
ROAD
PLUM
LEE
LORAINE
CEDAR ST
HICKORY ST
WALNUT ST
25A
27A
30 A
32 A
33A
34
26A
29A
31 A
AVE
EVANS ST
MILL
SRUCE
ST
403
405
407
406
408
PINE
HIGH
QUINCE
ST
STUDY AREA NORTH AND NORTHEAST OF SITE
PRICE'S LANDFILL SITE
RISLEY AVE
235
19
18
5
17
2
ATLANTIC CITY Electric
FIRE
ROAD
LEEDS
23
21
72
14
11
10
190
8
7
15
4
5
TWP
PLEASANTVILLE
AC ELECTRIC
10
7.0 Acs
12
15.45 Acs
15
10 Acs
5
3.7 Acs
11
4.25 Acs
4
2.64 Acs
13
2.10 Acs
DELILAH
PRICE LANDFILL
EGG HARBOR TWP

APPENDIX A

State of New Jersey

DEPARTMENT OF HEALTH
JOHN FITCH PLAZA
CN 360, TRENTON, N.J. 08625

SHIRLEY A. MAYER, M.D., M.P.H.
COMMISSIONER

CONSENT FORM

I have been informed that the New Jersey State Department of Health is conducting a study of environmental factors and their effect on the health of individuals. This study involves obtaining information from me about my residence, and health, as well as some information about other substances I may have been exposed to. The interview will require approximately 15 minutes of my time. I understand it may be necessary to contact me again.

I have agreed to take part in this study and to give information to the interviewer understanding that:

1. My responses will be kept completely confidential.
2. My participation is voluntary and I am free to discontinue participation at any time.
3. The information in this study will be summarized by New Jersey State Department of Health to determine whether environmental factors in this area may be contributing to health problems.

Name (Print) ______________________________

Participant Signature ______________________________

Date: ____________________

Household Number ______________

Interviewer's Name ______________

Respondent's Name ______________

Address ______________

Mailing address if diffrent ______________

Now I want to ask you about all persons who live in this household. (Interviewer to circle race of household here: White Non-white)

What are the names of all persons who live here?

What are the ages?

Does or did anyone smoke cigarettes regularly (at least once a day for a year or 20 packs in a lifetime)?

(CODE 1 = Current Smoker

2 = Ex smoker (quit more than 1 year ago.)

3 = Non-smoker

Does anyone in this household have a regular exposure either at a job or hobby to chemicals?

(Code 1 = At job 2 = Hobby . 3 = None)

	Name	Age	Sex	Smoking Status	Dust or Chemical Exposure
Subject # 1					
2					
3					
4					
5					
6					

What is the source of your water for showering, bathing and washing dishes?

(If water is from different sources check more than one box and indicate percentage for all sources and indicate year)

Private well ☐ ________ Mo. __ Yr. __ to Mo. __ Yr. __
Municipal water ☐ ________ Mo. __ Yr. __ to Mo. __ Yr. __
Bottled water ☐ ________ Mo. __ Yr. __ to Mo. __ Yr. __
Other ☐ ________ Mo. __ Yr. __ to Mo. __ Yr. __

What is the source of the water you use for cooking and drinking?

(If water is from different sources check more than one box and indicate percentage for all sources and indicate year)

Private well ☐ Mo. __ Yr. __ to Mo. __ Yr. __
Municipal well ☐ Mo. __ Yr. __ to Mo. __ Yr. __
Bottled water ☐ Mo. __ Yr. __ to Mo. __ Yr. __
Other ☐ Mo. __ Yr. __ to Mo. __ Yr. __

Have you been informed that your water is contaminated? Yes __ No __

If yes, Date ____/____/____
day Mo. Yr.

Household ____________________
Subject ____________________

Are you bothered by any of the following:

If yes, to any of the below symptoms, ask: How frequently does these symptoms occur?

Code: 1 = Seldom
2 = Monthly
3 = Weekly
4 = Daily

Have you been bothered by these symptoms?

	Yes	No	Frequency of Symptom	Seen by physician Yes	Seen by physician No
Eye irritation (itchy, red or watery eyes)	___	___	____________	___	___
Nasal irritation (sneezing, runny nose or stuffness)	___	___	____________	___	___
Skin rash	___	___	____________	___	___
Skin irritation (redness)	___	___	____________	___	___
Tiredness	___	___	____________	___	___
Pain in joints	___	___	____________	___	___
Pain in muscles	___	___	____________	___	___
Nausea	___	___	____________	___	___
Diarrhea	___	___	____________	___	___
Loss of appetite	___	___	____________	___	___
Loss of weight (without dieting)	___	___	____________	___	___
Stomach pain	___	___	____________	___	___
Other gastrointestinal problems	___	___	____________	___	___

(specify) ____

____

Have you been told by a physician that you have a medical problem?
Yes ___ No ___ If yes, name of physician and phone number.

If yes, describe condition and date of diagnosis.

____

____

____

For any women living in the house: Have you had trouble becoming pregnant or with a pregnancy? Yes ___ No ___

If yes, describe and list years.

____

____

____

Have you ever been bothered by the taste of water in this community? Yes ___ No ___

These are all the questions I have for you. Is there anything else that I haven't asked you about that you think is important?

In case I've forgotten to ask you something and my supervisor needs to call you back, may I have a phone number and a convient time to reach you?

Phone ____________________

Best Time ____________________ AM PM   Time Ended ____________________ AM PM

PRICE STUDY

EYE IRRITATION - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	28	43.8	19	26.4	2.02
	12	18.8	6	8.3	2.28
	16	25.0	16	22.2	0.40
PRICE MALE	22	38.6	11	21.6	1.87
	13	22.8	5	9.8	2.34
	11	19.3	7	13.7	1.18
PRICE MALE AND FEMALE	50	41.3	30	24.4	1.96*
	25	20.7	11	8.9	2.36*
	27	22.3	23	18.7	1.00
CURRENT FEMALE USERS - PRIVATE WELL WATER	7	50.0	19	26.4	3.99*
	3	21.4	6	8.3	4.44
CURRENT MALE USERS - PRIVATE WELL WATER	4	30.8	11	21.6	1.25
	2	15.4	5	9.8	1.10
FORMER FEMALE USERS - PRIVATE WELL WATER	19	40.4	19	26.4	1.61
	7	14.9	6	8.3	1.53
FORMER MALE USERS PRIVATE WELL WATER	17	39.5	11	21.6	1.82
	10	23.3	5	9.8	2.29

PRICE STUDY APPENDIX TO TABLE II

NASAL IRRITATION - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
	23	35.9	26	36.1	0.93
PRICE FEMALE	10	15.6	5	6.9	2.29
	13	20.3	19	26.4	0.69
	21	36.8	13	25.5	1.48
PRICE MALE	8	14.0	1	2.0	14.78*
	9	15.8	9	17.6	0.72
	44	36.4	39	31.7	1.11
PRICE MALE	18	14.9	6	4.9	3.24*
AND FEMALE	22	18.2	28	22.8	0.68
CURRENT FEMALE	8	57.1	26	36.1	2.05
USERS - PRIVATE	3	21.4	5	6.9	8.75*
WELL WATER					
CURRENT MALE	2	15.4	13	25.5	0.49
USERS - PRIVATE	1	-	1	2.0	4.16
WELL WATER					
FORMER FEMALE	14	29.8	26	36.1	0.72
USERS - PRIVATE	6	12.8	5	6.9	1.57
WELL WATER					
FORMER MALE USERS	19	44.2	13	25.5	1.96
PRIVATE	7	16.3	1	2.0	14.64*
WELL WATER					

PRICE STUDY APPENDIX TO TABLE I.

RASH - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
	22	34.4	8	11.1	4.12*
PRICE FEMALE	13	20.3	3	4.2	6.06*
	8	12.5	6	8.3	1.74
	20	35.1	10	19.6	2.04
PRICE MALE	7	12.3	2	3.9	2.72
	7	12.3	7	14.7	0.82
	42	34.7	18	14.6	3.04*
PRICE MALE AND FEMALE	20	16.5	5	4.1	4.17*
	15	12.4	13	10.6	1.26
CURRENT FEMALE USERS - PRIVATE WELL WATER	6	42.9	8	11.1	11.32*
	5	35.7	3	4.2	8.80*
CURRENT MALE USERS - PRIVATE WELL WATER	1	7.7	10	19.6	0.30
	0	-	2	3.9	0.00
FORMER FEMALE USERS - PRIVATE WELL WATER	14	29.8	8	11.1	3.24*
	6	12.8	3	4.2	3.84
FORMER MALE USERS PRIVATE WELL WATER	19	44.2	10	19.6	2.91*
	7	16.3	2	3.9	3.82

PRICE STUDY

APPENDIX TO TABLE II

SKIN IRRITATION - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	17	26.6	4	5.6	7.13*
	7	10.9	2	2.8	4.33
	7	10.9	3	4.2	3.35
PRICE MALE	13	22.8	5	9.8	2.46
	7	12.3	2	3.9	3.06
	4	7.0	2	3.9	1.62
PRICE MALE AND FEMALE	30	24.8	9	7.3	4.21*
	14	11.6	4	3.3	3.62*
	11	9.1	5	4.1	2.46
CURRENT FEMALE USERS - PRIVATE WELL WATER	2	14.3	4	5.6	2.72
	0	-	2	2.8	0.00
CURRENT MALE USERS - PRIVATE WELL WATER	1	7.7	5	9.8	0.41
	0	-	2	3.9	0.00
FORMER FEMALE USERS - PRIVATE WELL WATER	15	31.9	4	5.6	9.32*
	7	14.9	2	2.8	6.40*
FORMER MALE USERS PRIVATE WELL WATER	12	27.9	5	9.8	3.51*
	7	16.3	2	3.9	4.01

PRICE STUDY **APPENDIX TO TABLE II**

TIREDNESS - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	27	42.2	23	31.9	1.47
	22	34.4	11	15.3	2.75*
	12	18.8	9	12.5	1.49
PRICE MALE	24	42.1	12	23.5	1.99
	20	35.1	8	15.7	2.39
	4	7.0	3	5.9	0.93
PRICE MALE AND FEMALE	51	42.1	35	28.5	1.67
	42	34.7	19	15.4	2.61*
	16	13.2	12	9.8	1.21
CURRENT FEMALE USERS - PRIVATE WELL WATER	8	57.1	23	31.9	3.66*
	7	50.0	11	15.3	6.38*
CURRENT MALE USERS - PRIVATE WELL WATER	3	23.1	12	23.5	0.60
	2	15.4	8	15.7	0.59
FORMER FEMALE USERS - PRIVATE WELL WATER	18	38.3	23	31.9	1.14
	14	29.8	11	15.3	2.13
FORMER MALE USERS PRIVATE WELL WATER	20	46.5	12	23.5	2.66*
	17	39.5	8	15.7	3.14*

PRICE STUDY APPENDIX TO TABLE II

JOINT PAIN - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	29	45.3	18	25.0	2.27*
	19	29.7	7	9.7	3.62*
	18	28.1	15	20.8	1.26
PRICE MALE	16	28.1	6	11.8	2.35
	9	15.8	3	5.9	3.29
	4	7.0	2	3.9	1.33
PRICE MALE AND FEMALE	45	37.2	24	19.5	2.12*
	28	23.1	10	8.1	3.19*
	22	18.2	17	13.8	1.11
CURRENT FEMALE USERS - PRIVATE WELL WATER	6	42.9	18	25.0	2.41
	4	28.6	7	9.7	4.25
CURRENT MALE USERS - PRIVATE WELL WATER	3	23.1	6	11.8	1.48
	1	7.7	3	5.9	0.86
FORMER FEMALE USERS - PRIVATE WELL WATER	22	46.8	18	25.0	2.23
	14	29.8	7	9.7	3.27*
FORMER MALE USERS PRIVATE WELL WATER	12	27.9	6	11.8	2.40
	7	16.3	3	5.9	4.30*

PRICE STUDY

APPENDIX TO TABLE II

MUSCLE PAIN - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	19	29.7	13	18.1	1.79
	6	9.4	5	6.9	1.29
	8	12.5	10	13.9	0.80
PRICE MALE	10	17.5	1	2.0	8.19*
	1	17.5	0	-	∞
	2	3.5	0	-	∞
PRICE MALE AND FEMALE	29	23.9	14	11.4	2.16*
	7	5.8	5	4.1	1.25
	10	8.3	10	8.1	0.87
CURRENT FEMALE USERS - PRIVATE WATER WATER	7	50.0	13	18.1	4.36*
	1	7.1	5	6.9	1.12
CURRENT MALE USERS - PRIVATE WELL WATER	1	7.7	1	2.0	2.58
	1	7.7	0	-	∞
FORMER FEMALE USERS - PRIVATE WELL WATER	12	25.5	13	18.1	1.34
	5	10.6	5	6.9	1.36
FORMER MALE PRIVATE WELL WATER	9	20.9	1	2.0	11.36*
	0	-	0	-	0.00

PRICE STUDY APPENDIX TO TABLE II

NAUSEA - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	21	32.8	9	12.5	3.18*
	7	10.9	2	2.8	3.95
	9	13.1	6	8.3	1.66
PRICE MALE	13	22.8	5	9.8	2.23
	3	5.3	2	3.9	1.29
	2	3.5	0	-	∞
PRICE MALE AND FEMALE	34	28.1	14	11.4	2.78*
	10	8.3	4	3.3	2.51
	11	9.1	6	4.9	1.68
CURRENT FEMALE USERS - PRIVATE WELL WATER	5	35.7	9	12.5	3.76*
	0	-	2	2.8	0.00
CURRENT MALE USERS - PRIVATE WELL WATER	1	7.7	5	9.8	0.57
	0	-	2	4.1	0.00
FORMER FEMALE USERS - PRIVATE WELL WATER	14	29.8	9	12.5	2.86*
	7	14.9	2	2.8	4.98*
FORMER MALE USERS PRIVATE WELL WATER	12	27.9	5	9.8	3.01
	3	7.0	2	3.9	1.71

PRICE STUDY

APPENDIX TO TABLE II

DIARRHEA - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	13	20.3	13	18.1	1.18
	2	3.1	2	2.8	1.08
	5	7.8	5	6.9	1.06
PRICE MALE	9	15.8	3	5.9	2.65
	1	1.8	1	2.0	0.66
	2	3.5	0	-	∞
PRICE MALE AND FEMALE	22	18.2	16	13.0	1.45
	3	2.5	3	2.4	0.90
	7	5.8	5	4.1	1.41
CURRENT FEMALE USERS - PRIVATE WELL WATER	1	7.1	13	18.1	0.28
	0	-	2	2.8	0.00
CURRENT MALE USERS - PRIVATE WELL WATER	2	15.4	3	5.9	2.40
	1	7.7	1	2.0	5.00
FORMER FEMALE USERS - PRIVATE WELL WATER	11	23.4	13	18.1	1.52
	2	4.3	2	2.8	1.32
FORMER MALE USERS PRIVATE WELL WATER	7	16.3	3	5.9	2.84
	0	-	1	2.0	0.00

LOSS OF APPETITE - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	7	10.9	4	5.6	1.94
	4	6.3	2	2.8	1.92
	2	3.1	1	1.4	1.76
PRICE MALE	16	28.1	6	11.8	2.41
	9	15.8	1	2.0	7.80*
	5	8.8	2	3.9	2.23
PRICE MALE AND FEMALE	23	19.0	10	8.1	2.44*
	13	10.7	3	2.4	4.06*
	7	5.8	3	2.4	2.18
CURRENT FEMALE USERS - PRIVATE WELL WATER	2	14.3	4	5.6	3.54
	1	7.1	2	2.8	4.50
CURRENT MALE USERS - PRIVATE WELL WATER	5	38.5	6	11.8	3.14
	3	23.1	1	2.0	15.00x*
FORMER FEMALE USERS - PRIVATE WELL WATER	5	10.6	4	5.6	1.89
	3	6.4	2	2.8	1.87
FORMER MALE USERS PRIVATE WELL WATER	10	23.3	6	11.8	1.90
	5	11.6	1	2.0	4.73

PRICE STUDY APPENDIX TO TABLE II

WEIGHT LOSS - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	11	17.2	6	8.3	2.17
	2	3.1	1	1.4	1.69
	7	10.9	4	5.6	1.97
PRICE MALE	3	5.3	2	3.9	1.13
	1	1.8	0	-	∞
	0	-	1	2.0	0.0
PRICE MALE AND FEMALE	14	11.6	8	6.5	1.71
	3	2.5	1	0.8	2.28
	7	5.8	5	4.1	1.32
CURRENT FEMALE USERS - PRIVATE WELL WATER	0	-	6	8.3	0.00
	0	-	1	1.4	0.00
CURRENT MALE USERS - PRIVATE WELL WATER	1	7.7	2	3.9	1.26
	0	-	0	-	0.00
FORMER FEMALE USERS - PRIVATE WELL WATER	11	23.4	6	9.1	2.91*
	2	4.3	1	1.4	1.91
FORMER MALE USERS PRIVATE WELL WATER	2	4.7	2	3.9	1.00
	1	2.3	0	-	∞

PRICE STUDY APPENDIX TO TABLE II

ABDOMINAL PAIN - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	15	23.4	7	9.7	2.79*
	4	6.3	3	4.2	1.80
	6	9.4	5	6.9	1.39
PRICE MALE	15	26.3	6	11.8	2.49
	8	14.0	2	3.9	3.37
	5	8.8	1	2.0	4.09
PRICE MALE AND FEMALE	30	24.8	13	10.6	2.79*
	12	9.9	5	4.1	2.66
	11	9.1	6	4.9	1.85
CURRENT FEMALE USERS - PRIVATE WELL WATER	3	21.4	7	9.7	2.74
	0	-	3	4.2	0.00
CURRENT MALE USERS - PRIVATE WELL WATER	1	7.7	6	11.8	0.48
	1	7.7	2	3.9	1.61
FORMER FEMALE USERS - PRIVATE WELL WATER	11	23.4	7	9.7	2.92*
	4	8.5	3	4.2	2.51
FORMER MALE USERS PRIVATE WELL WATER	13	30.2	6	11.8	3.09*
	6	14.0	2	3.9	3.32

OTHER - BY NUMBER OF CASES, PERCENT AND RELATIVE RISK

WATER USE BY SOURCE SEX AND FREQUENCY OF COMPLAINTS	EXPOSED		UNEXPOSED		RELATIVE RISK
	#	%	#	%	
PRICE FEMALE	8	12.5	6	8.3	1.55
	3	4.7	2	2.8	1.65
	5	7.8	4	5.6	1.37
PRICE MALE	5	8.8	1	2.0	3.03
	3	5.3	0	-	∞
	2	3.5	1	2.0	0.75
PRICE MALE AND FEMALE	13	10.7	7	5.7	1.74
	6	5.0	2	1.6	2.64
	7	5.8	5	4.1	1.17
CURRENT FEMALE USERS - PRIVATE WELL WATER	0	-	6	8.3	0.00
	0	-	2	2.8	0.00
CURRENT MALE USERS - PRIVATE WELL WATER	1	7.7	1	2.0	2.22
	0	-	0	-	0.00
FORMER FEMALE USERS - PRIVATE WELL WATER	7	14.9	6	8.3	1.87
	3	6.4	2	2.8	2.02
FORMER MALE USERS PRIVATE WELL WATER	4	9.3	1	2.0	2.83
	3	7.0	0	-	∞

Appendix B

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FACT SHEET
on the completion of the
Remedial Investigation/Feasibility Study
for the Price Landfill site
Pleasantville City and Egg Harbor Township
Atlantic County

Price Landfill is a 26-acre site originally mined for sand and gravel. The site became a commercial landfill receiving municipal solid waste in 1969. In May, 1971, the landfill began to accept bulk and drummed liquid and solid chemical wastes. Available information indicates that these wastes included industrial chemicals, sludges, oils, greases and sewage. Total quantities dumped are estimated to be at least nine million gallons. Chemical waste disposal operations were terminated in November, 1972; sludge disposal was terminated in May, 1973 and municipal waste disposal was terminated in 1976. In December, 1982 the Price Landfill site was placed on the National Priorities List (NPL) by the United States Environmental Protection Agency (USEPA). Of 97 New Jersey sites on the NPL, this site ranks third.

Monitoring data indicates considerable ground water contamination exists in the vicinity of Price Landfill. Among the contaminants present are benzene, cadmium, chloroform, dichloroethylene, lead, 1-2-transdichloroethylene, trichloroethylene, vinyl chloride and acetone. The ground water flow in the area of the landfill is complex, with three separate aquifer formations located within 150 feet from the surface. The plume of contamination extends almost one mile from the site and the contaminants tend to move in an east-northeast direction.

In December, 1981, USEPA commissioned a contractor, Camp, Dresser and McKee (CDM), to prepare a two-part study addressing: 1) the immediate measures necessary to ensure a supply of uncontaminated water to affected communities for the summer of 1982 and 2) the long-term remedial solutions necessary to protect the water supply and to remediate the discharge of contaminants from the landfill.

During April, 1982, CDM issued a report outlining initial measures necessary to ensure the summer water supply: upgrading of the water treatment plant, the redevelopment of three production wells, installation of a water supply system interconnection, provision of standby carbon filter units and implementation of water conservation measures and a ground water monitoring program. These measures were successfully implemented.

In June, 1983, CDM issued a second report summarizing its full investigative study. This included development of computer ground water flow models designed to assess the movement of contaminants leaching from the landfill and an evaluation of ten remedial alternatives. This study led to a decision to relocate the Atlantic City Municipal Utilities Authority (ACMUA) wells. From the ten remedial alternatives outlined in the study, four were selected for further investigation and the computer models were recalibrated to 1984 field conditions to predict the behavior of each of these alternative courses of action. These four alternatives were studied in depth during a subsequent remedial investigation and feasibility

over...

In each case, the exact configuration of the extraction wellfields, including the number of wells, the individual well pumping rates and the specific locations, both horizontally and vertically within the aquifer system, are subjects to be addressed by the engineering design of the selected alternative.

Copies of CDM's final report are available for public review at the following locations:

1. Office of the Mayor
   Egg Harbor Township Municipal Building
   262 Bargaintown Road
   Linwood, NJ 08221

2. Office of the City Clerk
   18 North First Street
   Pleasantville City, NJ 08232

3. Office of the City Clerk
   City Hall
   Absecon, NJ 08201

4. Atlantic City Public Library
   1 North Tennessee Avenue
   Atlantic City, NJ 08401

The New Jersey Department of Environmental Protection (NJDEP) and USEPA are recommending implementation of Alternative 2. A public meeting to discuss this report will be held in July and followed by a 21-day comment period during which comments on the report will be received by NJDEP. They should be addressed to:

Grace L. Singer, Chief
Office of Community Relations
Division of Hazardous Site Mitigation
New Jersey Department of Environmental Protection
432 East State Street
Trenton, NJ 08625

For further information contact Susan Gall, Office of Community Relations, Division of Hazardous Site Mitigation, at (609) 633-2320.

6/86
NJDEP

Appendix C

Grace Singer
Office of Community Relations
Division of Hazardous Site Mitigation
Department of Environmental Protection

Price's Pit Remediation Alternative 2, Plume Abatement, seems to be the most sound measure, financially and technically. The containment wall appears grandiose and not necessarily more effective. Capping the site would only delay the inevitable problem and should not be done. Rather, as proposed in Alternative 4, the more dilute water of the deep wells should be used to flush the site to enhance the removal of the contamination.

I would like to see a more aggressive approach at the site itself, however. An attempt should be made to exhume the source of the pollution by digging down to the surface of the plume, slightly downstream, and attacking the heaviest concentrations directly. Discharge of the deep well water, slighty upstream, should help to float the plume and lead to quickest remediation.

Of more concern is the county's new dump proposal and the department's lack of guidance in the selection process. Less than a mile away, a new resource recovery plant is planned. Since the plant itself would require only 20 or so acres, but 265 are being purchased, one can only assume the Doughty Road Site will also be used to landfill the ash from the plant. This site is cut in half by Jarrett's Run, a tributary to Absecon Creek, and is flood prone. Far more suitable for landfill purposes is the Mill Road site across the street (Delilah Rd.) from Price's Pit. Remediation measures which you are now undertaking would also contain any groundwater contamination which might develop in the future from the Mill Road dump site. It seems far preferable to use an area just upstream from one that is already polluted and undergoing cleanup, rather than a relatively clean one. I would hope that the Department of Environmental Protection begins to protect the environment before a problem exists, rather than attempt remediation after it is too late.

Bob Filipczak

Bob Filipczak
2001 Shore Rd.
Linwood, NJ 08221

(Encosure)

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best available copy.

ATLANTIC COUNTY, NEW JERSEY

RESOURCE RECOVERY SITING ANALYSIS AND TECHNOLOGY ASSESSMENT

FINAL REPORT

JUNE 1986

DRAFT

NEW JERSEY
ATLANTIC COUNTY

Prepared For:

ACUA **ATLANTIC COUNTY UTILITIES AUTHORITY**

1701 Absecon Boulevard
Atlantic City, New Jersey 08401

Prepared by:

A Joint Venture

STV/SANDERS & THOMAS
ENGINEERS ARCHITECTS PLANNERS. 11 ROBINSON STREET, POTTSTOWN, PENNSYLVANIA 19464
PROJECT NO.: 5472

THE TARQUINI ORGANIZATION
ARCHITECTS AND PLANNERS. 1812 FEDERAL STREET, CAMDEN, NEW JERSEY 08105
PROJECT NO.: 3246A

RGH **ROGERS, GOLDEN & HALPERN**
ENVIRONMENTAL ENERGY AND LAND USE CONSULTANTS
1216 ARCH STREET, PHILADELPHIA, PENNSYLVANIA 19107
PROJECT NO.: 175.09

1.4.1 Site A: Doughty Road

GENERAL LOCATION: In Egg Harbor Township east of the Parkway and Doughty Rd.

ESTIMATED SIZE: Approximately 265 acres

VEGETATION: Pine-oak forest; hardwood swamp forest

ON-SITE USES: Active and inactive excavations

ADJACENT LAND USES: Vacant, forested land; power lines and highways

SURROUNDING DENSITY (within 1/4 mi)[*]: Low - moderate (10 - 20 dwellings)

TRUCK ACCESS: From the islands: Absecon Blvd.-Delilah Rd.-Doughty Rd. or
Absecon Blvd.-Westcoat Rd.-Doughty Rd.
From the mainland: Expressway-Delilah Rd.-Doughty Rd.

TRAFFIC CONSTRAINTS: Traffic congestion along Doughty Rd.; awkward intersection at Doughty and Delilah Rds. 1,000 feet to the south; Doughty Rd. unimproved at site

ACQUISITION CONSTRAINTS: Low (two principal owners)

SEWER SERVICE AVAILABILITY: Doughty Rd. Pumping Station 1.2 miles to the west

PUBLIC WATER SUPPLY AVAILABILITY: N.J. Water Co. 12-inch line on Delilah Rd. 1,200 ft. to the south

PROXIMITY TO SUBSTATIONS/ENERGY MARKETS: Lewis substation 4,000 feet to the southeast.

STATE PERMITTING JURISDICTIONS: CAFRA

PLANNED DEVELOPMENT: Demolition landfill proposed on-site in 1981; 264-unit residential development with 37,000 sq. ft. office building proposed 2,000 ft. to the northeast in 1985

OTHER CONSTRAINTS: Approximately 40% of the site is restricted from use by structures 263 feet in height due to proximity to Atlantic City International Airport; potential for on-site contamination from nearby disposal pit being investigated (may require ECRA permit); Stream and Flood Hazard Area bisects site

---

[*] DENSITY CLASSIFICATIONS: Low: fewer than 10 dwellings
(for all sites)
Low - moderate: 10 - 19 dwellings
Moderate: 20 - 29 dwellings
Moderate - high: 30 - 39 dwellings
High: 40 or more dwellings

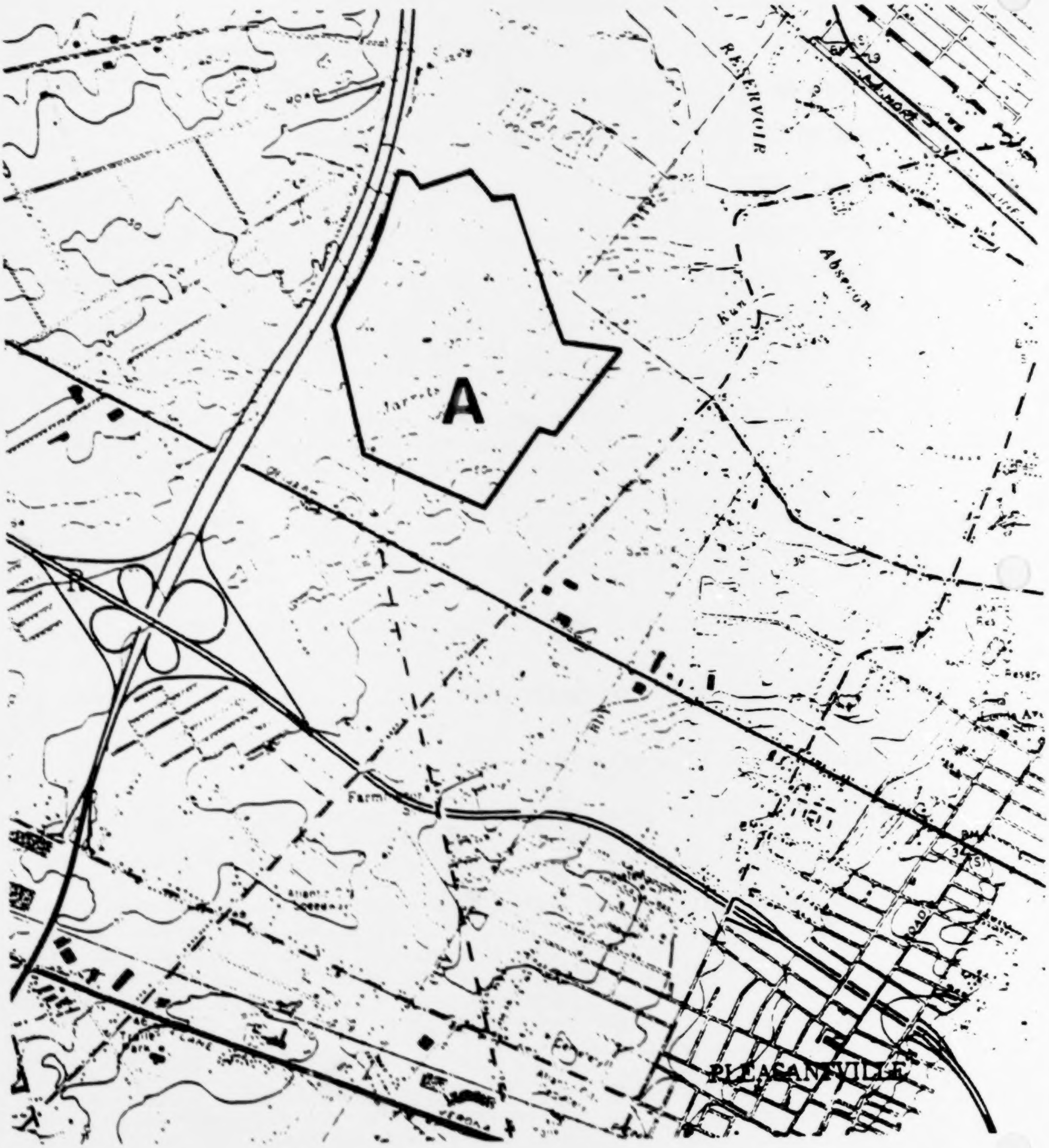

RESERVOIR
Absecon
Run
A
PLEASANTVILLE
ROAD

Figure 1.12 Site A: Doughty Road

1.4.2 Site B: Mill Road

GENERAL LOCATION: In Pleasantville at the Egg Harbor Township line north of the Atlantic City Expressway

ESTIMATED SIZE: Approximately 90 acres

VEGETATION: Agricultural/urban land

ON-SITE USES: Inactive excavations

ADJACENT LAND USES: Industrial and commercial development; highways and related uses

SURROUNDING DENSITY (within 1/4 mi): High (greater than 40 dwellings)

TRUCK ACCESS: From the islands: Expressway or Delilah Rd. to Mill Rd.
From the mainland: Expressway or US Rte 40/322 to Delilah Rd.

TRAFFIC CONSTRAINTS: Potential for shared access from A.C. Expressway maintenance yard; improvements planned to upgrade Delilah Rd. right-of-way and intersections; traffic volumes on adjacent streets moderate; westbound trucks exiting the Expressway will be helped by proposed third lane

ACQUISITION CONSTRAINTS: Low (Predominant area under single ownership)

SEWER SERVICE AVAILABILITY: Two separate 8-inch lines available, both on Mill Rd. along eastern boundary of site

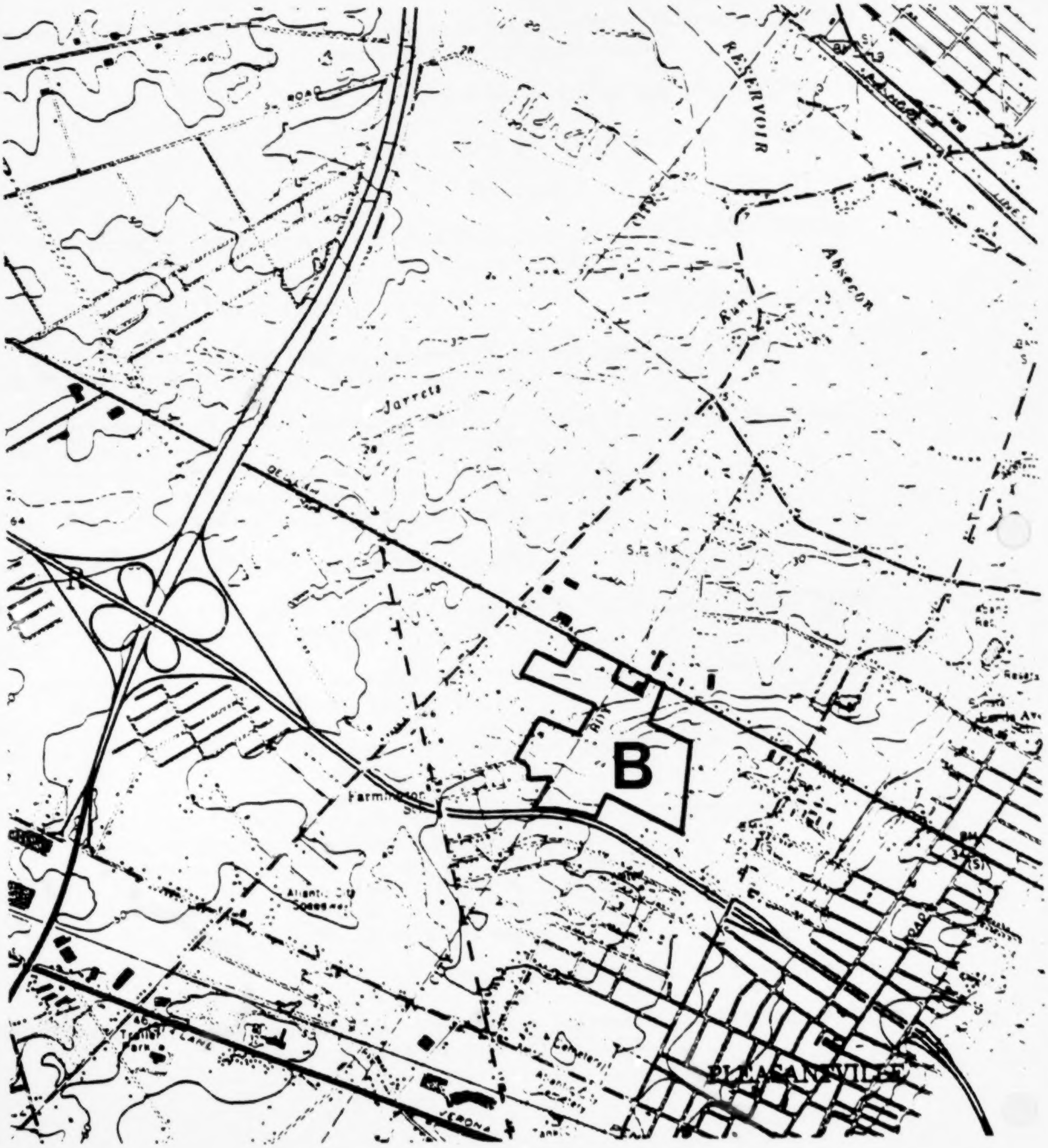
PUBLIC WATER SUPPLY AVAILABILITY: N.J. Water Co. 12-inch line on Delilah Rd. along northern boundary of site

PROXIMITY TO SUBSTATIONS/ENERGY MARKETS: Lewis substation 2,000 feet to the north

PLANNED DEVELOPMENT: Proposed bus parking and maintenance facility next to site at southeast corner, Delilah and Mill roads (1986); 400-unit townhouse/condominium complex proposed across Mill Road from site (not yet submitted); various commercial and industrial proposals in the immediate area

STATE PERMITTING JURISDICTIONS: CAFRA

OTHER CONSTRAINTS: Potential for icing on A.C. Expressway from condensation of vapors emitted by cooling tower


RESERVOIR
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Jarrets
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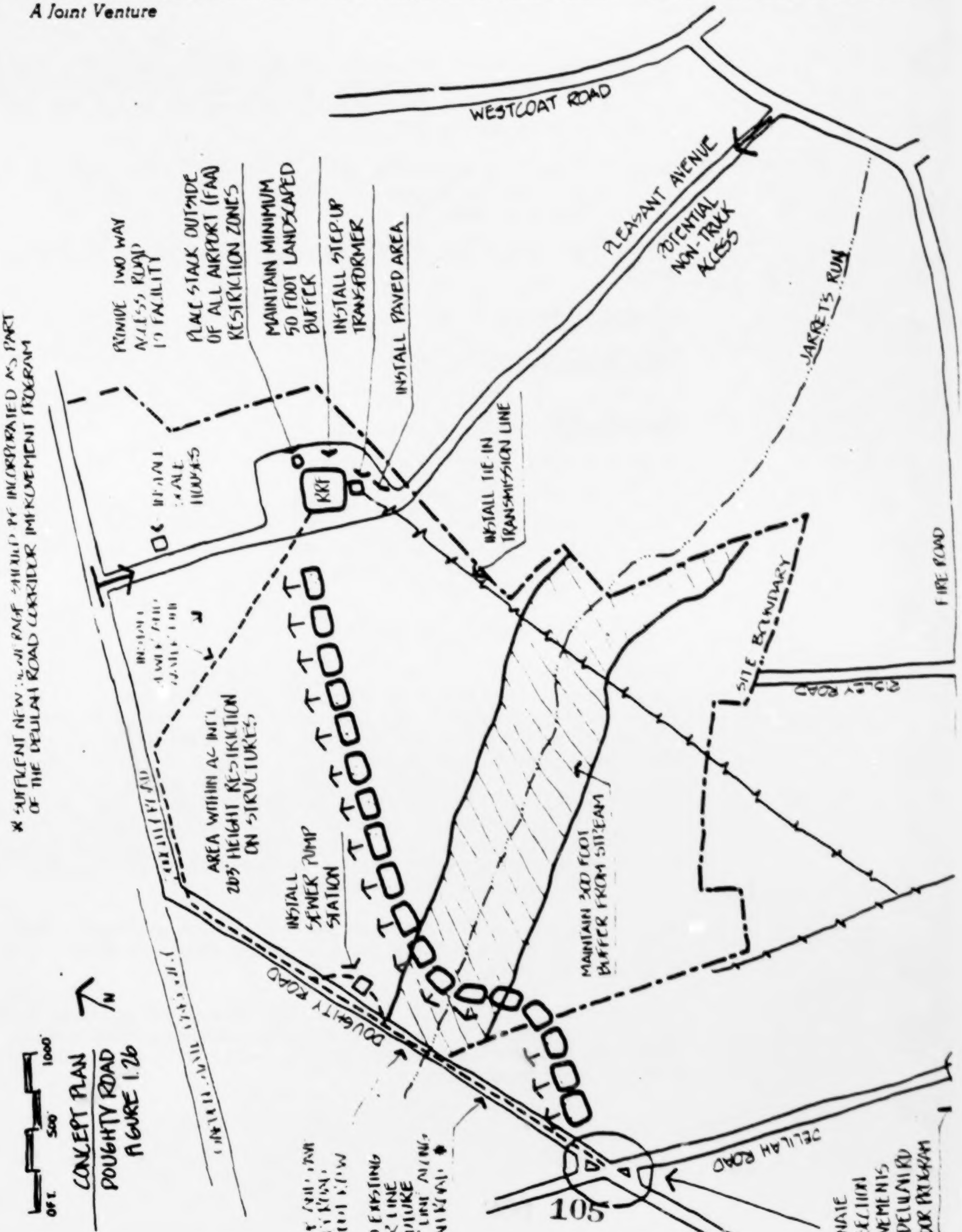
Farmington
PLEASANTVILLE
VERONA
Cemetery

Figure 1.13 Site B: Mill Road


WESTCOAT ROAD
PLEASANT AVENUE
POTENTIAL NON-TRUCK ACCESS
JARRETS RUN
FIRE ROAD
RIDLEY ROAD
SITE BOUNDARY
PROVIDE TWO WAY ACCESS ROAD TO FACILITY
PLACE STACK OUTSIDE OF ALL AIRPORT (FAA) RESTRICTION ZONES
MAINTAIN MINIMUM 50 FOOT LANDSCAPED BUFFER
INSTALL STEP-UP TRANSFORMER
INSTALL PAVED AREA
INSTALL TIE-IN TRANSMISSION LINE
KRF
SCALE HOUSES
AREA WITHIN AC INTL 203' HEIGHT RESTRICTION ON STRUCTURES
INSTALL SEWER PUMP STATION
MAINTAIN 300 FOOT BUFFER FROM STREAM
DOUGHTY ROAD
DELILAH ROAD
* SUFFICIENT NEW INTERNAL ... SHOULD BE INCORPORATED AS PART OF THE DELILAH ROAD CORRIDOR IMPROVEMENT PROGRAM
0 FT.
500
1000'
N

CONCEPT PLAN
DOUGHTY ROAD
FIGURE 1.26

bordered by the Black Horse Pike (US 40/322) on the north, English Creek-Port Republic Road (Rt 575) on the east, the former Pennsylvania-Reading Seashore Lines right-of-way on the south, and the Township Limits on the west.

Owner: Atlantic Electric Company
1600 Pacific Avenue
Atlantic City, NJ

Total Area: About 380 acres within a somewhat regularly shaped parcel.

Proposed Facility Area: 92.9 acres

1.7.3 Facility - Related Factors

1.7.3.1 Doughty Road

Available Land Area:

Availability is a function of a number of factors. But, considering only parcel size, given the need for twenty acres, the Doughty Road site has about 280 acres in excess of that which is necessary. However, please see "Flooding Susceptibility," and "Airport Restriction Zones," below.

Site Traffic Patterns and Access:

Access to the site is provided via Delilah and Doughty Roads on the southwest. Access might be provided via Westcoat and Doughty Roads on the northwest, Fire Road and Pleasant Avenue on the northeast, and Fire and Risley Roads on the east if existing earth berms were removed.

Westcoat, Delilah and Fire roads are county roads. Each is a 2-lane bituminous asphalt highway without curb and gutter, nor controlled frontage access. Delilah and Fire Roads are inadequate for existing and projected traffic volumes, (particularly during rush hours), and type (more and more industrial).

Visibility and turning lane storage are dangerously restricted, particularly at the intersections of Doughty/Delilah Roads, and Fire/Delilah Roads.

The results of the Delilah Road Corridor Study are expected from the Atlantic County Planning Department sometime during summer, 1986, and will include recommendations which will alleviate the problems described above.

Within the site, Doughty Road is a dirt road providing direct access to the interior of the site. It is used by sand and gravel haulers, and has been used by the occasional surreptitious dumper. The road has been closed with an earth berm at its north end (Westcoat Road) in an attempt to curtail access and illegal dumping. Doughty Road might be incorporated with the plan of the proposed facility. If it is, then it should be paved.

Risley Road is a dirt road leading into the site from Fire Road on the east. It has been closed with an earth berm at the property line and if it is incorporated with the plan of the proposed facility, it should be paved.

Utilities:

Sewer service is not directly available to the Doughty Road site. Connection might be made at the Delilah Road Pump Station, about one and one-half miles west of Fire Road on Delilah Road. Another connection might be made with the Washington Avenue Trunk Line, about one and one-quarter miles to the south. Both potential connections would require crossing either the Garden State Parkway or the Atlantic City Expressway. A third possible connection might be made at a point about three-quarters of a mile east of Fire Road, along Delilah Road.

Considering the improvements tentatively scheduled for Delilah Road, it certainly would seem sensible to consider expanding sewer service along Delilah Road to Pleasantville, at the same time the roadway is reconstructed.

Expansion of sewer service in this area (as well as improvements to Delilah Road) would boost the area's desirability for industrial development.

Adequate water supply is available along Delilah and/or Fire Roads.

Thermal Energy Users:

Given the findings and experiences related to the County's Resource Recovery Feasibility Study of July, 1984, it seems that the best market for thermal energy is future industrial development within the surrounding area.

Therefore, the proposed facility should include sufficient flexibility in design to allow retrofit of necessary equipment when such a market can be encouraged to evolve, and as such a market does evolve.

Electric Utility Interconnection:

Electric power for on-site use will be generated by the proposed facility. Excess power would be fed into Atlantic Electric Co.'s system via the Lewis Substation (69KV) located across Fire Road about 2000 feet from the usable portion (see "Airport Restriction Zones" below) of the Doughty Road area.

Solid Waste Transport Costs:

Relative solid waste transport costs for comparison of a number of locations can be quickly estimated once a waste centroid is determined for the area in which the locations are found. Relative costs can be expressed in terms of how far the locations are from the centroid. The location furthest from the centroid will have the highest transport cost. Please see Section 1.3.2: "Highway Access/Solid Waste Transportation Cost/Proximity to Ash and Residue Disposal Landfills," for a definition of a waste centroid. As identified in previous sections of this report, the centroid for Atlantic County is located at the interchange between the Garden State Parkway and the Atlantic City Expressway.

The distance between the Doughty Road site and the solid waste centroid for Atlantic County is about 7000 feet, (same as Mill Road, less than McKee City).

Topography and Terrain:

The site is a sand and gravel borrow pit. The majority of the site has been strip-excavated to the elevations of various clay lense stratum, leaving several flat areas or benches with differences in elevation of from 5 to 30 feet. Spoil with higher clay content has been stockpiled at certain locations in the site.

The resulting terrain within the pit is irregular with interspersed pockets (some with standing water) and hillocks scattered about the flats and benches.

The borrow areas are almost totally devoid of vegetation save that typically associated with highly disturbed and infertile soils. Within the site, the heaviest and least disturbed vegetation is associated with the Jarrets Run stream bed.

Jarrets Run crosses the middle of the site from the southwest to the northeast. Field investigation (3/26/86) found a dry stream bed at the Doughty Road crossing (two 12 inch pipes) on the southwest, and a flowing stream about five feet wide and six-twelve inch maximum depth at the Fire Road crossing (24 inch corrugated metal pipe) on the northeast.

Along the perimeter of the pit, a cross section of the natural terrain has been exposed to a depth of from 20 to 25 feet. At the rim, the overstory and ground cover (Jack Pine/Red Oak scrub forest association) can be clearly seen above the sand and gravel outwash soils typical of the region.

The northeastern portion of the site, associated with Jarrets Run and a smaller stream, parallel and about 1000 feet to the north is within a flood prone area. This area is bordered by Fire Road and Wescoat Road, and the limits between Pleasantville and Egg harbor Township.

Airport Restriction Zones:

The western 75 percent of the Doughty Road site is unavailable for use as a location for the proposed facility's stack (263 feet high) due to height restrictions associated with the FAA Technical Center, which lies three miles away toward the northwest.

Regulatory Permitting and Appproval Requirements:

The Doughty Road area falls under the aegis of the Coastal Area Facility Review Act, CAFRA (N.J.S.A. 13:19-1 et seq). The proposed facility will require submission of an Environmental Impact Statement to, review by, and permit from the New Jersey Department of Environmental Protection (DEP), Division of Coastal Resources, Bureau of Coastal Project Review. Detailed consideration will be required by DEP, Stream Encroachment, as a result of on-site surface water, i.e., Jarrets Run.

The proposed facility will require submission of a form 7460-1 to; reviewed by, and permit from the Federal Aviation Administration, since it will include a structure greater than 200 feet high.

1.7.3.2 Mill Road

Available Land Area:

Availability is a function of a number of factors. But considering only parcel size, given the need for twenty acres the Mill Road site has about 70 acres in excess of that which is necessary.

Site Traffic Patterns and Access:

Access to the site is available via frontage along Delilah Road on the north, and frontage along Mill Road on the east.

Delilah Road is a county road. Mill Road is a local collector road. For a discussion of Delilah road, as well as conditions applicable to Mill Road (including the Mill and Delilah Roads intersection), please refer to Section 1.7.3.1: "Doughty Road, Site Traffic Patterns and Access," in the preceding section.

Utilities:

Two separate eight-inch gravity sewer lines are directly available to the Mill Road site, yielding a total 16 inches of available capacity.

Capacity could be increased if necessary. Since both lines end on Mill Road at a ridge which crosses the site, a pumping station could be built on the site which serves either or both eight-inch lines. Therefore, sewer service to the Mill Road site is redundant, as well as sufficient in capacity. Less chance exists for interrupted waste management services due to failure in sewage treatment service.

One eight-inch line runs easterly along Delilah Road across the north end of the site. Another branch begins about 500 feet south of Delilah Road and runs northerly along Mill Road to join the eight-inch line coming from the west along Delilah Road. The merged lines then run northeasterly from the intersection of Delilah and Mill Road to the plant.

The second separate eight-inch line begins at a point 1000 feet south of Delilah Road, and runs southerly along Mill Road, turns east with Mill Road into Martin Terrace, and along Martin Terrace to Route 9, where it leads northerly along Route 9 to the plant.

Adequate water supply is available along Delilah Road.

Thermal Energy Users:

Please refer to the above discussion on Thermal Energy Users under Section 1.7.3.1: "Doughty Road, Site Traffic Patterns and Access," in the preceding section.

Electric Utility Interconnection:

Electric power for on-site use will be generated by the proposed facility. Excess power would be fed into Atlantic Electric Company's system via the Lewis Substation (69kV) located about 2000 feet to the north, across Delilah Road.

Solid Waste Transport Costs:

Relative solid waste transport costs for comparison of a number of locations can be quickly estimated once a waste centroid is determined for the area in which the locations are found. Relative costs can be expressed in terms of how far the locations are from the centroid. The location furthest from the centroid will have the highest transport cost. See Section 1.3.2: "Highway Access/Solid Waste Transportation Cost/Proximity to Ash and Residue Disposal Landfills," for definition of a waste centroid. As identified in previous sections of this investigation report, the centroid for Atlantic County is located at the interchange between the Garden State Parkway and the Atlantic City Expressway.

The distance between the Mill Road site and the solid waste centroid for Atlantic County is about 7000 feet, (same as Doughty Road, Less than McKee City).

Topography and Terrain:

The Mill Road site is a sand and gravel borrow pit. The majority of the site has been strip-excavated to the elevations of various clay lense stratum, leaving several flat areas or benches with differences in elevation of from 5 to 30 feet. Spoil with higher clay content has been stockpiled at certain locations in the site.

The resulting terrain within the pit is irregular with interspersed pockets (some with standing water) and hillocks scattered about the flats and benches.

The borrow areas are almost totally devoid of vegetation save that typically associated with highly disturbed and infertile soils. Within the site, the heaviest and least disturbed vegetation is found along the western perimeter and at the northwest and southwest corners.

Along the perimeter of the pit, a cross section of the natural terrain has been exposed to a depth of from 10 to 30 feet. At the rim, the overstory and ground cover (Jack Pine/Red Oak scrub forest association) can be clearly seen above the sand and gravel outwash soils typical of the region.

Flooding Susceptibility:

The site is entirely clear of the projected and recorded limits of flooding due to a 100-year storm.

Airport Restriction Zones:

No portion of the site is unavailable to the proposed facility due to Airport related restrictions.

Regulatory Permitting and Approval Requirements:

The Mill Road area falls under the aegis of the Coastal Area Facility Review Act, CAFRA (N.J.S.A. 13:19-1 et seq). The proposed facility will require submission of an Environmental Impact Statement to, review by, and permit from the New Jersey Department of Environmental Protection, Division of Coastal Resources, Bureau of Coastal Project Review.

The proposed facility will require submission of a Form 7460-1 to, review by, and permit from the Federal Aviation Administration, since it will include a structure greater than 200 feet high.

1.7.3.3 McKee City

Available Land Area:

Availability is a function of a number of factors. But considering only parcel size, given the need for twenty acres the McKee City site has about 360 acres in excess of that which is necessary. However, please see: "Airport Restriction Zones," below.

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION
CN 028, Trenton, N.J. 08625
609 - 984 - 2902

RICHARD C. SALKIE, P.E.
ACTING DIRECTOR

17 SEP 1986

Mr. Bob Filipczak
2001 Shore Road
Linwood, NJ 08221

Dear Mr. Filipczak:

I would like to thank you for your interest and recent letter regarding remediation of the Price Landfill Site. This is in response to the concerns you have raised and will be included as part of the responsiveness summary for the record of decision.

With regard to implementation of Alternative 4 (a containment wall with plume abatement and flushing), this alternative was removed from consideration in a preliminary screening of the technical feasibility of suggested remedial alternatives. The technical feasibility is questionable with regard to the proposed flushing design because non-uniform void spaces exist within the landfill materials. When water infiltrates the unsaturated zone it has a tendency to seek the path of least resistance and would not uniformly filter through the landfill. This results in heavier flushing in some areas and reduced flushing in other areas, compromising the effectiveness of a recirculation system. This non-uniformity cannot be defined adequately to estimate the level of flushing reliability. Because of this uncertainty, this alternative was removed from further consideration.

With regard to your suggestion to excavate down to the heaviest concentration of contaminants and remove these materials, this process is problematic for environmental, technical and financial reasons. Excavating the landfill to the areas of heaviest concentration of contaminants would require excavating the entire landfill since the specific heavily contaminated areas are not known. This process would release volatile organic compounds into the atmosphere in an uncontrolled manner and is not advisable. Technically, this would require the use of heavy construction equipment and the loading and transporting of the landfill materials to another site. In addition, this operation would not be cost-effective because remediation of the landfill would still require the pumping and treating of large quantities of groundwater. The recommended alternative (#2: plume abatement), will capture the contaminants adjacent to the landfill and pull back the major section of the plume that has already moved off site. Because of the characteristics of the contaminants, primarily their solubility in water, discharging water upstream as you suggest may not float the plume and lead to the quickest remediation.

With regard to your concerns with Atlantic County's proposed resource recovery facility, the Department is aware of the environmental sensitivity of the area and, through existing regulations, will continue to protect the environment. The proposed Mill Road site is not upstream from the Price Landfill site but rather cross-gradient or adjacent to the Price site. The siting of this facility is the County's responsibility. The State's responsibility is to insure compliance with current environmental regulations concerning the planning, construction and operation of such a facility.

If you have any other questions, please feel free to contact me at (609) 984-2991.

Very truly yours,

George Klein
Assistant Chief
Bureau of Site Operations

HS17:fb

Appendices D and E

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BETSY L. WEISS

August 4, 1986

FEDERAL EXPRESS

Grace L. Singer, Chief
Office of Community Relations
Division of Hazardous Site Mitigation
New Jersey Department of Environmental Protection
432 East State Street
Trenton, NJ 08625

Re: Price's Landfill, Egg Harbor Township and Pleasantville, Atlantic County, New Jersey

Dear Ms. Singer:

We submit this Comment on the Remedial Investigation/Feasibility Study ("RI/FS") for Price's Landfill, on behalf of some of the defendants, third and fourth party defendants in United States v. Price, et al., Civil Action No. 80-4104, pending in the United States District Court for the District of New Jersey. That lawsuit was brought by plaintiff the United States Environmental Protection Agency ("EPA") and plaintiff-intervenor the New Jersey Department of Environmental Protection ("NJDEP") to recover costs of investigation and remediation, and for other relief, against certain alleged owner/operators, haulers and generators in connection with the disposal of wastes at Price's Landfill. Yet EPA and NJDEP failed to notify those defendant individuals and companies when EPA and NJDEP recently released the RI/FS for public comment and when they held a public meeting on the RI/FS in July 1986. We have since learned that the RI/FS was released for public comment on or about June 4, 1986, and that the public comment period expires on August 5, 1986.

We request that this Comment letter be considered by EPA and NJDEP in their evaluation of the RI/FS and their selection of a remedial plan for Price's Landfill. As we advised plaintiffs EPA and NJDEP previously on numerous occasions in connection with the Price case, we disagree with many of the conclusions contained in the RI/FS, and we believe that the proposed remedial plan is not cost effective, does not meet the requirements of the National Contingency Plan, and will not work. Our comments, and the bases for those comments were presented at length to EPA, NJDEP and their attorneys and experts in the numerous meetings, conferences, reports, memoranda and correspondence identified on the attached Appendix, and on other occasions. Those comments addressed the following subjects, among others;

1. The influenece and appropriateness of government policy considerations in the remedial investigation and decision-making process.

2. The effectiveness and appropriateness of the locations, pumping rates, and pumping time periods for the proposed treatment wells.

3. The accuracy and appropriateness of the computer modeling analysis performed by Camp, Dresser & McKee, and of the assumptions on which it was based.

4. The achievability and appropriateness of the proposed clean-up standards for the remedial plan.

5. The timing and appropriateness of the proposed method of landfill closure.

6. The availability, cost effectiveness, and appropriateness of other alternative monitoring and remedial plans.

Because the Third Case Management Order and Confidentiality Order, as amended, entered in the Price case prohibits disclosure of the substance of our comments made in those meetings, conferences, reports, memoranda and correspondence, we cannot repeat those comments here. We incorporate them by reference, however, for full consideration in the remedial plan administrative selection process. Under the National Contingency Plan, and as a fiduciary for the Hazardous Substance Response Trust Fund and for the public, including the defendants in Price, you are obligated to take our comments into consideration. Therefore, if because of public disclosure obligations or any other reason, EPA and NJDEP believe that they cannot use and consider fully in the administrative process our comments in the form they were presented previously, it is your obligation to so advise us immediately. In that event, we will discuss with counsel for EPA and NJDEP a mechanism for obtaining Court approval to release that information under the Third Case Management Order and Confidentiality Order.

Very truly yours,

Gail H. Allyn

GAIL H. ALLYN

GHA:ob
cc: Samuel P. Moulthrop, Esq.
Richard F. Engel, Esq.
John Matthews, Esq.
William K. Sawyer, Esq.
Members of the Defendants' Study Group in U.S. v. Price

APPENDIX

A. Comments made by defense counsel and defense experts Geraghty & Miller and SMC Martin in the following letters, reports and other materials submitted to plaintiffs' counsel:

1. **Report prepared by Geraghty & Miller, Inc. entitled "Preliminary Investigation of Hydrogeologic Conditions at Price's Landfill, Pleasantville, New Jersey" dated March 1985 (2 vols.)**
2. Report prepared by SMC Martin entitled "Hydrogeological Study and Site Assessment of Price's Landfill, Atlantic County, New Jersey" dated March, 1985 (4 vols.)
3. Water quality data from monitoring wells in the vicinity of Price's Landfill from samples taken by Geraghty & Miller and SMC Martin in 1984 and 1985.
4. Letter from William H. Hyatt, Jr. to Honorable Jerome B. Simandle dated March 18, 1985.
5. Letter from Gail H. Allyn to Samuel P. Moulthrop dated April 26, 1985, with enclosed letter and attachments from Michael F. Wolfert of Geraghty & Miller to William H. Hyatt, Jr. dated April 26, 1985.
6. Memorandum and enclosure from Daniel J. Shoemaker of SMC Martin to Jeffrey P. Heppard dated April 25, 1985.
7. Letter from Gail H. Allyn to Samuel P. Moulthrop dated May 13, 1985, with enclosures from Geraghty & Miller.
8. Letter from Gail H. Allyn to Samuel P. Moulthrop and Richard F. Engel dated June 24, 1985, with enclosures prepared by Geraghty & Miller and SMC Martin.
9. Letter from Benjamin G. Stonelake to Samuel P. Moulthrop dated July 31, 1985, with enclosures prepared by Geraghty & Miller.
10. Letter from Jeffrey P. Heppard to Samuel P. Moulthrop dated August 21, 1985.
11. Letter from Jeffrey P. Heppard to Roger Bernstein and Richard F. Engel dated September 6, 1985, with enclosures prepared by SMC Martin.
12. Letter from William H. Hyatt, Jr. to Samuel P. Moulthrop dated October 16, 1985.

B. Comments made by defense counsel and/or defense experts Geraghty & Miller and SMC Martin to plaintiffs'counsel and/or plaintiffs' experts Camp, Dresser & McKee, and other representatives of EPA and NJDEP at meetings held on the following dates:

January 4, 1985
March 18, 1985
March 26, 1985
April 17, 1985
May 24, 1985
May 29, 1985
July 12, 1985
July 16, 1985
July 23, 1985
August 2, 1985
August 9, 1985
August 19, 1985
August 29, 1985

C. Comments made by defense counsel to the Court and to plaintiffs' counsel at conferences and during telephone conference calls with Honorable Jerome B. Simandle on the following dates:

March 29, 1985
April 19, 1985
June 3, 1985
July 2, 1985
July 17, 1985
August 5, 1985
August 13, 1985
August 23, 1985
August 30, 1985
September 20, 1985

PITNEY, HARDIN, KIPP & SZUCH

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CLYDE A. SZUCH
S. JOSEPH FORTUNATO
DAVID J. CONNOLLY, JR.
WILLIAM H. HYATT, JR.
LAWRENCE F. REILLY
MURRAY J. LAULICHT
EDWARD P. LYNCH
GERALD C. NEARY
JOSEPH LUNIN
RICHARD L. PLOTKIN
TIMOTHY R. GREINER
ROBERT L. HOLLINGSHEAD
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VALLRIE J. BAUMANN
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THOMAS J. MALMAN
DAVID NIU
KAREN M. PALMA
JAMES D. RAY
SCOTT A. SMITH
KENNETH E. THOMPSON
PETER G. VERNIERO
MILLIE E. WILLIAMS
IVETTE R. ALVAREZ
MATTHEW J. BROAS
JOANNE C. PALUMBO
HOPE S. CONE
LAURAN S. D'ALESSIO
JENNIFER CHANDLER HAUGE
CYNTHIA A. ROTZ
BETSY L. WEISS

FEDERAL EXPRESS

September 20, 1986

Richard F. Engel
Deputy Attorney General
Department of Law and Public Safety
Division of Law
Environmental Protection Section
Richard J. Hughes Justice Complex
CN 112
Trenton, NJ 08625

Re: Price's Landfill, Atlantic County, New Jersey

Dear Mr. Engel:

In response to your letter of September 4, 1986, and in accordance with our subsequent telephone conversation concerning an extension of time for any additional comments, I am enclosing a letter from Geraghty & Miller to William H. Hyatt, Jr. dated October 1, 1985 as an additional comment on the Draft Remedial Investigation/Feasibility Study ("RI/FS") for Price's Landfill. I believe that this letter was not submitted previously to DEP or EPA, although its technical comments are incorporated in the October 16, 1985 letter from William H. Hyatt, Jr. which was sent to Samuel Moulthrop and yourself.

This October 1, 1985 letter from Geraghty & Miller was prepared in connection with our settlement negotiations in United States v. Price, and is subject to the

Confidentiality Order which remains in effect in that case. Therefore, I request that you take steps to maintain the confidentiality of this document, as you have with respect to the other documents identified in my letter of August 4, 1986 to Grace L. Singer, a copy of which is enclosed.

Very truly yours,

Gail H Allyn

GAIL H. ALLYN

GHA:rp

cc: Samuel Moulthrop, Esq. (By Regular Mail)
William K. Sawyer, Esq. " " "
John Matthews, Esq. " " "
Jeffrey P. Heppard, Esq. " " "
Grace L. Singer " " "
Benjamin Stonelake, Esq. " " "
Other Members of the Defendants' Study Group in U.S. v. Price
(By Regular Mail)

Appendix F

State of New Jersey

DEPARTMENT OF LAW AND PUBLIC SAFETY
DIVISION OF LAW
ENVIRONMENTAL PROTECTION SECTION
RICHARD J. HUGHES JUSTICE COMPLEX
CN 112
TRENTON 08625

(609) 984-5612

W. CARY EDWARDS
ATTORNEY GENERAL

DONALD R. BELSOLE
FIRST ASSISTANT ATTORNEY GENERAL

DEBORAH T. PORITZ
ASSISTANT ATTORNEY GENERAL
DIRECTOR

THEODORE A. WINARD
ASSISTANT ATTORNEY GENERAL
DEPUTY DIRECTOR

LAWRENCE E. STANLEY
DEPUTY ATTORNEY GENERAL
SECTION CHIEF

JOHN M. VAN DALEN
DEPUTY ATTORNEY GENERAL
ASSISTANT SECTION CHIEF

September 4, 1986

Gail H. Allyn, Esq.
Pitney, Hardin, Kipp & Szuch
CN 1945
Morristown, NJ 07960-1945

Re: Price's Landfill, Atlantic County, New Jersey

Dear Gail:

This constitutes the DEP response to your letter of August 4, 1986 concerning the Draft Remedial Investigation/Feasibility Study ("RI/FS") for the Price landfill. In that letter you note that, because of the Third Case Management Order and Confidentiality Order entered in the case of United States v. Price (80-4104), you cannot publicly submit comments on the RI/FS, and thus refer DEP/EPA to various documents and oral comments on the issues presented in the RI/FS, and make them your comments.

DEP/EPA have no problem with your use of that letter and the written material noted therein as constituting your comments on the RI/FS, in light of the restrictions in the Confidentiality Order. We do, however, have a problem with your concept of oral communications as constituting formal comments on the RI/FS, because there is no written record of such comments. Please understand that we say that not in an attempt to preclude your comments. Rather, we do not think it is proper to attempt to reconstruct for purposes of the DEP/EPA response document what was said by either side at the meetings, conferences and calls referred to in your letter.

Thus, DEP/EPA are responding to your written comments by referring you to our written comments for the period from January, 1985 to May, 1986. Just as the Confidentiality Order prevents you from revealing your comments, we cannot publish our comments in our responsiveness summary. We believe our previous written responses adequately address all of your comments.

If today's letter response is not satisfactory to you, please let us know by September 12. If we do not hear from you by the end of business on that date, or if this letter is satisfactory, the public comment period will be over as of September 12.

Sincerely,

W. CARY EDWARDS
Attorney General of New Jersey

By:
Richard F. Engel
Deputy Attorney General

/cmg
cc: Samuel Moulthrop, Esq.
William K. Sawyer, Esq.
John Matthews, Esq.
Jeffrey P. Heppard, Esq.
Grace L. Singer

bcc George Klein

Appendix G

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EPA

News Release

80(61) Suzanne Weiss (202) 755-0344
James R. Marshall (212) 264-4913

EPA APPROVES ACTION TO PROTECT ATLANTIC CITY WATER

FOR RELEASE, MONDAY, DECEMBER 28, 1981

WASHINGTON - Anne M. Gorsuch, Administrator of the U.S. Environmental Protection Agency (EPA), has approved funding of a study to determine the best method to protect the public water supply of Atlantic City, New Jersey, from contamination by chemical wastes migrating out of Price's Pit, a nearby disposal site. Ms. Gorsuch also approved funding for a standby supply of activated carbon to be used to treat the city's water if and when it should become contaminated while a long-term clean-up program is being developed.

The study, estimated to cost $500,000, and the standby carbon supply, estimated to cost up to $1 million, are to be funded under the Comprehensive Environmental Response, Compensation and Liability Act, known as "Superfund."

-more-

"Price's Pit ranks among the top priority Superfund sites in the nation," Ms. Gorsuch pointed out. "Today's decision demonstrates EPA's determination to take quick and effective action where a potential public health risk is involved."

Since May, Ms. Gorsuch has approved the allocation of approximately $33 million from Superfund for emergency and remedial action at hazardous waste sites around the country.

Price's Pit, a now inactive 26-acre landfill in the town of Pleasantville, six miles northwest of Atlantic City, received drummed and bulk chemical wastes from 1968 to 1976. Leachate from the landfill has contaminated nearby private drinking water wells serving 37 homes. Tests show that the contaminants are moving through the groundwater and have approached a well field serving Atlantic City.

On December 22, 1980, the U.S. Department of Justice filed suit at EPA's request against the former and present owners of the landfill. On September 23, 1981 the State of New Jersey issued an administrative order directing the New Jersey Water Company and the affected municipalities to extend water mains to supply the already affected houses.

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U.S. MAIL

EPA News Release

FOR IMMEDIATE RELEASE 82(11) Lillian Johnson (212) 264-4534

EPA SCHEDULES PUBLIC MEETING FOR PRICE LANDFILL SITE

NEW YORK -- A public meeting has been scheduled by the U.S. Environmental Protection Agency (EPA) for comments on an Interim Plan concerning Price Landfill site in the Town of Pleasantville, Atlantic County, N. J. The document contains preliminary recommendations and a plan of action for implementing, in the event that the contamination emanating from the Price Landfill site threatens the Atlantic City Municipal Utilities Authority water supply this summer.

The meeting will be held April 6, 1982 at 1:00 p.m. at the Main Meeting Hall, Municipal Building, Bargain Town Fire Road, Egg Harbor Township, N.J.

Copies of the Interim Plan are available at these locations:

1) Egg Harbor Township Information Room
% Mayor John J. Heinz, Jr.
R.D. #1
Linwood, N.J.

2) City Clerk's Office
% Mr. William Hurd, Administrator
City Hall
Absecon, N.J.

(more)

3) City Clerk's Office
% Mr. George R. English
City Hall
18 North Main Street
Pleasantville, N.J.

4) Mayor Joseph Lazarow
City Hall
Atlantic City, N.J.

Also, representatives from EPA and the New Jersey State Department of Environmental Protection will be available for discussion and to respond to your comments.

##

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278

17 MAR 1982

Honorable John J. Heinz, Jr.
Mayor of Egg Harbor
RD # 1, Box 262
Linwood, New Jersey 08221

Dear Mayor Heinz:

This is to confirm that a public meeting on the Price Landfill site has been scheduled for 1:00 p.m. on April 6, 1982 at:

Main Meeting Hall
Municipal Building
Bargain Town/Fire Road
Egg Harbor Township, New Jersey

Of concern is the quality and quantity of drinking water that will be available this summer in the event that the contamination from the Price Landfill site threatens the Atlantic City Municipal Utilities Authority water supply. This issue is the subject of the Interim Plan; this Plan will be presented at the April 6 meeting for your consideration.

Representatives of the U.S. Environmental Protection Agency and the New Jersey State Department of Environmental Protection will be present at the April 6 meeting to discuss the Interim Plan and address any comments you or area residents may have on the Interim Plan. The Interim Plan will be available for public review prior to the meeting at the places listed on the enclosed sheet.

Your participation will be very much appreciated.

Sincerely yours,

Jacqueline E. Schafer

Jacqueline E. Schafer
Regional Administrator

Enclosure

cc: Commissioner Robert E. Hughey
New Jersey State Dept. of
Environmental Protection

Repositories for Interim Plan

Copies of the Interim Plan will be available for public review prior to the April 6, 1982 meeting at the following locations:

1) Egg Harbor Township Information Room
c/o Mayor John J. Heinz, Jr.
R.D. #1
Linwood, New Jersey

2) City Clerk's Office
c/o Mr. William Hurd, Administrator
City Hall
Absecon, New Jersey

3) City Clerk's Office
c/o Mr. George R. English
City Hall
18 North Main Street
Pleasantville, New Jersey

4) Mayor Joseph Lazarow
City Hall
Atlantic City, New Jersey

Mr. Lee Budd "Mr. Budd"
Health Officer
Atlantic City Health Department
2314 Pacific Avenue
Atlantic City, New Jersey 08401

[A]

Honorable William Gormley "Mr. Gormley"
New Jersey State Assemblyman
1125 Atlantic Avenue
Guarantee Trust Building, Suite 511
Atlantic City, New Jersey 08401

[A]

Honorable Michael Matthews "Mr. Matthews"
New Jersey State Assemblyman
3113 Atlantic Avenue
Atlantic City, New Jersey 08401

[A]

Honorable Steven Perskie "Mr. Perskie"
New Jersey State Senator
1125 Atlantic Avenue
Atlantic City, New Jersey 08401

[A]

Mr. John Mruz "Mr. Mruz"
District Director
Office of Honorable William Hughes
2307 New Road
Northfield, New Jersey 08225

[A]

Mr. Dennis F. Marco "Mr. Marco"
Special Assistant
Office of Senator Bill Bradley
1605 Vauxhall Road
Union, New Jersey 07083

[A]

Mr. Tom Delaney "Mr. Delaney"
Office of Senator Harrison Williams
Washington, D.C. 20510

SAME LETTER SENT TO:
[A]

Honorable Chris R. Leopardi "Mayor Leopardi"
Mayor of Absecon
City Hall
Absecon, New Jersey 08201

[A]

Honorable Joseph Lazarow "Mayor Lazarow"
Mayor of Atlantic City
City Hall
Atlantic City, New Jersey 08401

[A]

Honorable George Dix "Mayor Dix"
Mayor of Pleasantville
City Hall
Pleasantville, New Jersey 08232

[A]

Honorable Charles Worthington "Mr. Worthington"
County Executive
Guarantee Trust Building, Rm. 615
1125 Atlantic Avenue
Atlantic City, New Jersey 08401

[A]

Ms. Alice Gitchell "Ms. Gitchell"
Director of Environmental Health Service
Atlantic County Division of Public Health
201 South Shore Road
Northfield, New Jersey 08225

[A]

Mr. Neil Goldfine, Executive Director "Mr. Goldfine"
Atlantic City Municipal Utilities Authority
2101 Arctic Avenue
P.O. Box 1686
Atlantic City, New Jersey 08404

bcc: Paul Giardina, NJDEP
Jim Marshall
Lillian Johnson ✓
Shelley Holm
Jeane Rosianski
Ken Stoller
Bob Ogg
Don Diesco
Sal Badalamenti
John Frisco
Fred Rubel
Mike Bonchonsky
Jack Weber, Office of Congressional Liaison
Brad Cates, Office of Intergovernmental Liaison

2CIL:JROSIANSKI:tr:3/8/82

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EPA

News Release

82(19)
EPA Margaret Randol (212) 264-2515
DEP James Staples (609) 292-2994

FOR RELEASE: WEDNESDAY, MAY 12, 1982

DOCUMENTS SIGNED TO START REMEDIAL WORK TO PROTECT ATLANTIC CITY

ATLANTIC CITY, N.J.--Top officials from Federal and State environmental agencies and the Atlantic City Municipal Utilities Authority (MUA) signed documents here today to intitiate remedial work to protect Atlantic City drinking water against possible contamination this summer from a nearby hazardous waste site known as Price's Pit.

Officials expressed confidence that these protective actions will be ready, when and if needed, in June.

U.S. Environmental Protection Agency (EPA) Regional Administrator Jacqueline E. Schafer said, "Today, we are ensuring that immediate actions will be taken to protect the City's drinking water and prevent any disruption of service."

New Jersey Department of Environmental Protection (DEP) Commissioner Robert E. Hughey said that, "These documents represent a major step forward in the State and Federal governments' battle to control toxic contamination of our water

-more-

supplies. When fully implemented, emergency back-up water supplies will be available this summer and long-term action will follow."

Three formal documents were signed today. The first consists of a contract between EPA and the New Jersey DEP in which EPA agrees to be responsible for a number of actions that are part of the "Interim Action Plan" for the summer. Two separate contracts between DEP and the MUA spell out the responsibilities to be carried out by the MUA. Also today, a grant application for a cooperative agreement was signed by DEP and submitted to EPA for review and approval. Under the cooperative agreement, the State will agree to undertake additional elements of the "Action Plan".

Together, these documents establish responsibilities for the necessary remedial work, as well as the maintenance of a system to provide an alternate supply of drinking water. The elements of this system are as follows:

1. The redirection and repiping of the MUA production wells AC-14, AC-15 and AC-3 to discharge directly to the MUA water plant storage basins. This action will increase the capacity of the plant to use more of the surface water supply from the MUA's two reservoirs.
2. Iron sequestering treatment for MUA production well AC-3 to insure good water quality.
3. The construction of a new interconnection between the New Jersey Water Company (NJWC) and the MUA to enable the Authority's purchase of NJWC water. In addition, rehabilitation of an existing interconnection of the systems will be completed.
4. The site preparation of MUA production wells AC-4A and AC-2 for activated carbon treatment which will include preparation of the wells for hook-up to the

-more-

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278

AGENDA

PUBLIC MEETING

Price's Pit Landfill Site
Municipal Building
Egg Harbor Township, New Jersey

MAY 4, 1983
7:00 P.M.

I.	Welcome	Mayor Stanley R. Glassey Egg Harbor Township
II.	The Superfund Program	Jacqueline Schafer Regional Administrator U.S. Environmental Protection Agency, Region II
III.	New Jersey Department of Environmental Protection's Role at Price's Pit	Marwan Sadat, Administrator Hazardous Site Mitigation Administration N.J. Dept. of Environmental Protection
IV.	Discussion of the Groundwater Modeling Results	Brendan Harley, Vice President & Water Resources Specialist and
	Description of the Alternatives	James Wallace, Project Manager for Price's Pit Landfill
	Evaluation of the Alternatives	Camp Dresser & McKee
V.	ACMUA's Comments on EPA's Proposed Cleanup Efforts	Neil Goldfine, Executive Director Atlantic City Municipal Utilities Authority
VI.	Questions and Answers	
VII.	Closing	

State Senator Gormley present

activated carbon systems, as well as the installation of concrete pads to support the units.

The total construction costs of these action elements are estimated to be $160,000 dollars.

This proposed work is based on an evaluation of impacts which the Price landfill could have upon the MUA's water supply.

In December 1981, EPA Administrator Anne M. Gorsuch approved $1 million standby funding to be used to treat the Atlantic City water supply if it should become contaminated while a long-term cleanup program is being developed for Price's Pit.

At that time, Mrs. Gorsuch also approved $445,000 for a study to determine the best method of protecting the public water supply, as well as for additional field investigation studies.

Price's Pit, a now inactive 26-acre landfill in the town of Pleasantville, six miles northwest of Atlantic City, received drummed and bulk chemical wastes from 1971 to 1972.

On December 22, 1980, the U.S. Department of Justice filed suit at EPA's request against the former and present owners of the landfill. On Septermber 23, 1981, the State of New Jersey issued an administrative order directing the NJWC and the affected municipalities to extend water mains to supply the already affected houses.

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EPA Environmental Facts

May 1983

PRICE LANDFILL FEASIBILITY STUDY

This fact sheet summarizes the study conducted by Camp Dresser & McKee (CDM) at the direction of the U.S. Environmental Protection Agency (EPA) to compare various long-term action alternatives at Price Landfill. The landfill is an inactive hazardous waste site threatening drinking water supplies of Atlantic City. The feasibility study was financed by EPA through a Superfund grant of $445,000.

Site Background

Price's Pit is a 26-acre landfill that received industrial wastes from 1969 through 1976. It contains a range of chemicals, including benzene and chloroform, that was either disposed of in drums or poured directly into the landfill. Groundwater in the area is contaminated, with contamination moving slowly toward Atlantic City's public water supply well field.

Actions To Date

In December 1981, EPA announced a $445,000 6-month feasibility study and $1 million standby funding for an alternate system in case the City's water becomes contaminated before long-term remedial action is taken. In the early Summer of '82, EPA and the New Jersey Department of Environmental Protection (DEP) completed the initial remedial work to protect the City's drinking water in the short-term and to avoid any possible disruption of service by making emergency back-up water supplies available At EPA's request, the U.S. Department of Justice has filed suit against the former and present owners of the landfill, as well as all known transporters and generators. The New Jersey Water Company (NJWC) and the affected municipalities complied with a DEP order to extend water mains to supply already affected houses.

Objective of the Feasibility Study

The purpose of the study was to select the long-term alternative action that will ensure the existing ability of the Atlantic City Municipal Utility Authority (ACMUA) to deliver drinking water and reduce the effects of the contamination from the landfill. The preferred alternative action must accomplish this objective and do so with the greatest benefit to the public and the least negative impact to the environment.

Approach and Scope

The long-term remedial action alternatives were developed based on a study of the existing information on the contaminants known to be in the area.

The study evaluated the impacts of alternatives on the following areas:

Groundwater
Surface water
Air Quality
Terrestrial Habitat
Aquatic Habitats
Environmentally Sensitive Habitats
Economics and Population
Land Use
Community/Institutional Services
Energy (needed)

The major tools used in the evaluation of impacts were the existing physical conditions of the area and groundwater computer modeling results.

The Goals of EPA and DEP

- To ensure a long-term supply of good-quality drinking water for Atlantic City
- To minimize future contamination of private drinking water wells
- To prevent further spread of the contaminants from the landfill
- To safely treat and dispose of contaminants recovered from the groundwater

Conclusions

Based on a review of the environmental issues and cost and non-cost technical criteria, both EPA and DEP agree that the following two alternatives would be equally effective in best achieving the goals of the two agencies:

1. To relocate 13.5 million gallons per day of Atlantic City well capacity to a new location north of the city's reservoir; to extract 2 million gallons per day of the contaminated groundwater down gradient from the landfill and either treat it on site or discharge it for treatment in a nearby sewage treatment plant.
2. To relocate the wells, as described above; to construct a slurry wall in the ground surrounding the old landfill; to extract 2 million gallons per day of the contaminated groundwater outside the slurry wall and treat it as described above; to extract enough water from inside the slurry wall to prevent escape of contaminants from the landfill and treat it as described above.

The estimated capital costs for these alternatives range from $7.5 million to $13.1 million, and the estimated annual operating and maintenance costs range from $927,000 to $947,000, depending on the options selected.

TABLE 3-11 (cont.)

SUMMARY OF ALTERNATIVES

ALTERNATIVE NUMBER	DESCRIPTION	ATLANTIC CITY WATER SUPPLY				PLUME CONTROL OPTIONS	
		COHANSEY	KIRKWOOD	SURFACE RESERVOIR	TOTAL	NEW EXTRACTION WELLS	SLURRY WALL
9	• Extraction wells downgradient pumped at 2 mgd • Recharge to aquifer	13.8 mgd	2.2 mgd	9.0 mgd	25.0 mgd	6.6 mgd	none
10	• Slurry wall in conjunction with Alternative 5a	new wells 6.0 mgd existing wells 2.9 mgd (for short term)	2.2 mgd	9.0 mgd	20.1 mgd	7 mgd years 0-5; no control thereafter	yes.
11	• Slurry wall in conjunction with Alternative 9	13.8 mgd	2.2 mgd	9.0 mgd	25.0 mgd	6.6 mgd	yes
12	• Slurry wall constructed completely around the landfill area • Control only in landfill	13.8 mgd	2.2 mgd	9.0 mgd	25.0 mgd	none	yes
* 13	• New wells in Lower Cohansey north of reservoir • Existing wells abandoned • Extraction well placed downgradient at landfill and pumped at 2 mgd	new Cohansey wells 13.5 mgd	2.2 mgd	9.0 mgd	24.7 mgd	2.0 mgd	none
* 14A	• New wells in Lower Cohansey north of reservoir • Existing wells abandoned • Slurry wall constructed completely around the landfill area	new Cohansey wells 13.5 mgd	2.2 mgd	9.0 mgd	24.7 mgd	none	yes
* 14B	• New wells in Lower Cohansey north of reservoir • Existing wells abandoned • Slurry wall constructed completely around the landfill area • Extraction wells placed downgradient at landfill and pumped at 2 mgd	new Cohansey wells 13.5 mgd	2.2 mgd	9.0 mgd	24.7 mgd	2.0 mgd	yes

* Serious alternatives
([illegible] # 3)

Please Sign In

Price Meeting
May 4, 1983

NAME	ADDRESS or Affiliation
Edith Whitiaker	Somers Point,
David Sutton	Atl. Co. Health Dept
Thomas [illegible]	Mayor Michael Matthews, Margate
Edward [illegible]	English Creek
Michael E. Squires	Chairman Bd of Freeholders
John R. McCrea	Ocean Co. — Counsel
Arthur E. Shoaiman Jr	American Water Works Ser. Co
John [illegible] Morey	Congressman Hughes Office
Arthur R Henry	Arthur R Henry Inc Contract
Mayor Stanley R. Glassey	Egg Harbor Twp
Michael Zachowski	NJDEP - HSMA
Alice Mitchell	Atlantic County Public Heal
[illegible]	ACUA
William T. McLees	A.C M.U.A.
John F Brennan	Atlantic Co. Planning Di
[illegible] White	729 W. Calif. Ave.
Helen Walsh	Atl. Co. Administrator
Joseph [illegible]	Atlc Co Health Officer
[illegible]	Absecon City N.J
Larry [illegible]	WPVI-TV
Arlene [illegible]	321 Shore Rd Somers Pt
[illegible] Orchard	2 Deborah Lane, Egg Harbor Tw

Let's protect our earth

NEW JERSEY DEPARTMENT OF
ENVIRONMENTAL PROTECTION

CN 402, TRENTON, N.J. 08625
609-292-2994

NEWS

THOMAS H. KEAN, GOVERNOR

ROBERT E. HUGHEY, COMMISSIONER

(STATEWIDE)
No. 84/73

Immediate release:
December 14, 1983

Pleasantville (Atlantic County)
PUBLIC BRIEFING ON RELOCATION
OF THE ATLANTIC CITY WELLFIELD

TRENTON--State Department of Environmental Protection (DEP) Commissioner Robert E. Hughey announced today that a public briefing on the relocation of the Atlantic City wellfield will be held on Tuesday, December 20, at 7:30 pm in the Pleasantville Court and Police Administration Building, 17 First Street, in Pleasantville.

Hughey explained that the Price Landfill, a private facility, was operative from 1964 through the early 1970s when liquid chemical and industrial wastes were disposed of at the site. The Atlantic City wellfield, the drinking water supply for the 60,000 year-round residents, is located one mile downgradient of this Superfund site. Toxic pollutants migrating from the landfill near the municipalities of Egg Harbor Township and Pleasantville threaten the wellfield.

Representatives of the Department and of the engineering consultants on the investigation and relocation project, Roy F. Weston of West Chester, Pa., will discuss the wellfield relocation from its present site to the Federal Aviation Administration property between Pleasantville and Pomona.

The investigation, engineering design, and construction of the new wellfield are being conducted with $6,835,736 in Superfund monies awarded by the federal Environmental Protection Agency. These funds will also pay for the conceptual design and other studies on the management of the contaminant plume and the landfill site itself.

For additional information, contact Grace Singer, Hazardous Site Mitigation Administration, at 609/984/3081.

-dep-

Please Sign In

Public Meeting
May 4, 1983

Name	Address or Affiliation
Frances L. Sheridan	R.D.4, Box 498 Mays Landing
ADI ALETI	Stockton State College, Pomona NJ
B. M. [illegible]	N.J. Water Co.
V. Kuckenja	Calgon Corp. - Bridgewater, N.J.
Neil Goldfine	ACMUA
Gary Tomi	154 [illegible] Ave Absecon, NJ
Tim Kaye AC	ACPD
Odessa Quartermain	Rt3 Box 88A Absecon EHT
Constance L. Bridges	Box 88F Rt3 Absecon Egg
Arthur Hemmerell	Monmouth Beach PSEG
Elizabeth Dawson	NJDEP
✓ Mr & Mrs T. Hendricks	P.O. Box 297 Absecon
	54 Mill Rd Egg Harbor.
GENE DOEBLEY - EHT Committeeman	109 APPLES DR E.H.Tp
MATT DOEBLEY	" " " "
TOM VIVIANO	LAYNE - NEW YORK CO
BILL SEWARD	"

Sample

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
HAZARDOUS SITE MITIGATION ADMINISTRATION
CN 028 Trenton, N.J. 08625

MARWAN M. SADAT P.E.
DIRECTOR

JORGE H. BERKOWITZ Ph.D.
ADMINISTRATOR

FACT SHEET 12/20/83

NEW ATLANTIC CITY MUNICIPAL UTILITIES AUTHORITY (ACMUA) WELLFIELD

Current Project Funding:	Federal - $6,835,736 State - $ 585,748 $7,421,484 Award Date: October 27, 1983
Project Phase:	Design and construction of a new wellfield to eventually provide 13.5 MGD (million gallons/day) of water for ACMUA.
Proposed Wellfield Site:	Federal Aviation Administration (FAA) Property, north of the Atlantic City reservoir, Atlantic County (Based on preliminary investigations).
Wellfield Description:	Nine complete well installations at depths of 200 ft. into the lower Conansey Aquifer and a new water transmission pipeline to convey the water to an existing ACMUA treatment facility. Each well would produce 1,200 GPM (gallons per minute) of water at a continuous rate.
Engineering:	A contract was executed on October 14, 1983 between ACMUA and R.F. Weston, Inc. to assess potential pollution sources near the proposed wellfield, to investigate the characteristics of the aquifer, to modify wellfield designs, to manage installation of three test/production wells under Phase I, and to provide complete engineering construction services under Phase II.
Status:	Field reconnaissance of the FAA property resulted in identifying 58 potential contamination areas within a three mile radius of the wellfield site. Of these, four areas were selected for further investigation and sampling to determine if hazardous substances are actually present.

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N.J. Department of Environmental Protection
Division of Waste Management
Hazardous Site Mitigation Administration

Briefing
on
Site Remediation
at
Price's Landfill #1

Thursday, April 19, 1984
2:00 p.m.
Old Courtroom
Pleasantville Municipal Building
Pleasantville, N.J.

Agenda

1)	Overview of situation and introduction of Contractor, Camp, Dresser & McKee	Dr. Marwan Sadat Director, Division of Waste Management, NJDEP
2)	Presentation: Completion of Feasibility Study and Conceptual Design for site remediation	Camp, Dresser, & McKee
3)	Questions and Answers	

FACT SHEET
for
Briefing on Site Remediation
at
Price's Landfill #1
Egg Harbor Township and Pleasantville
Atlantic County
April 19, 1984

Site Description: Until the 1960's, Price's Landfill was a sand and gravel pit of approximately 26 acres. The pit was converted to a private landfill in 1969. During the early 1970's, industrial wastes were disposed of at the site. These included benzene, chloroform, trichloroethylene, sludges, grease, oil, septic tank and sewer wastes. Liquid chemical wastes were poured directly into the landfill as well as buried there in 55-gallon drums. The site is currently inactive.

Current Project Funding: Federal - $865,000 Award Date: 9/29/83

Background: In December, 1981 the U.S. Environmental Protection Agency (USEPA) commissioned consultants Camp, Dresser & McKee (CDM) to prepare a feasibility study for site remediation. CDM examined various long-term remedial actions and devised a 1982 Summer Interim Water Supply Plan (IWSP) to supply sufficient amounts of water during peak demand periods. The IWSP included activities for ground water monitoring and facility upgrading. On May 4, 1983 a public meeting was held in Egg Harbor Township on the CDM feasibility study alternatives. The New Jersey Department of Environmental Protection (NJDEP), under a Cooperative Agreement conducted a 1982-1983 winter monitoring program.

Status: Presently, NJDEP is planning to complete the feasibility study and accomplish a conceptual design for site remediation. This work involves the following tasks:

1) Data Compilation: Installation and sampling of ground water monitoring wells, an extended duration pump test at the landfill, and a sampling program for monitoring wells.
2) Engineering and Environmental Analysis: In order to evaluate four alternatives which are:
    a) No site remediation;
    b) Site remediation and treatment of ground water without a slurry wall;
    c) Treatment of ground water with a slurry wall; and
    d) More aggressive treatment of the landfill interior (i.e., recharge the water through the landfill within the

A Treatability Study and ground water modeling will be conducted along with the selected alternative b, c, or d. Relocation of the Atlantic City Municipal Utilities Authority (ACMUA) wellfield in ongoing, regardless of the chosen action.

3) Conceptual Design: Definition of design parameters, fine tuning prior to final design, and development of the scope of work for the final design.

Contractor: Camp, Dresser & McKee (CDM)

Schedule of Events

- Target wells for aerial survey
- Well drilling (2 shifts/day for approximately one month, on a 5-day/week
- CDM begins ground water model recalibration
- CDM begins Treatability Study
- CDM begins first round of ground water sampling
- CDM begins second round of ground water sampling
- Draft report on Feasibiltiy Study completed
- Public meeting on Draft Feasibility Study
- CDM finalizes the Feasibility Study, NJDEP finalizes the Federal Assistance Grant Application for Final Design and Construction. The goal is to secure federal funding for the Design and Construction by September 30, 1984.

N.J. Department of Environmental Protection
Division of Waste Management
Hazardous Site Mitigation Administration
Briefing on Site Remediation at
Price's Landfill #1
Thursday, April 19, 1984 at 2:00 p.m.
Old Courtroom
Pleasantville Municipal Building
Pleasantville, N.J.

	NAME	AFFILIATION	ADDRESS
1.	David [illegible]	ATLANTIC COUNTY HEALTH DEPT.	201 S. SHORE RD NORTHFIELD NJ [illegible]
2.			
3.	William E. [illegible]	City Hall Atlantic City	City Hall Atlantic City
4.	Tim Gordon	City Administrator Pleasantville	City Hall Pleasantville N.
5.	George W. Dix	Mayor Pleasantville	City Hall Pleasantville N.
6.	[illegible]	[illegible]	[illegible]
7.	[illegible]	(~~[illegible]~~) ACUA	Atlantic City, N.J.
8.	[illegible]	[illegible]	
9.	[illegible] Williams	City of Pleasantville	City Hall Pleas
10.	[illegible]	[illegible]	[illegible] [illegible]
11.	James Wallace	Camp, Dresser & McKee	Boston
12.	[illegible]	DEP	
13.	[illegible] Klein	DEP	

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting to Discuss Completion of the Remedial Investigation/Feasibility Study for the Price Landfill site

Tuesday, July 15, 1986
7:00 p.m.
Egg Harbor Township
Municipal Building
262 Bargaintown Road
Linwood, NJ

AGENDA

1.	Opening Remarks and Introduction of NJDEP and Camp Dresser & McKee Personnel	Mr. Anthony Farro, Assistant Director Division of Hazardous Site Mitigation
2.	Site History and Project Overview	Mr. George Kleir, Site Manager Division of Hazardous Site Mitigation
3.	Presentation of the Remedial Alternatives Evaluated in the Study	Dr. Brendon Harley, Vice President Camp Dresser & McKee, Inc. Dr. Lawrence Partridge, Vice President Camp Dresser & McKee, Inc.
4.	Discussion	The floor will be open for questions and comments at this time.

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FACT SHEET
on the completion of the
Remedial Investigation/Feasibility Study
for the Price Landfill site
Pleasantville City and Egg Harbor Township
Atlantic County

Price Landfill is a 26-acre site originally mined for sand and gravel. The site became a commercial landfill receiving municipal solid waste in 1969. In May, 1971, the landfill began to accept bulk and drummed liquid and solid chemical wastes. Available information indicates that these wastes included industrial chemicals, sludges, oils, greases and sewage. Total quantities dumped are estimated to be at least nine million gallons. Chemical waste disposal operations were terminated in November, 1972; sludge disposal was terminated in May, 1973 and municipal waste disposal was terminated in 1976. In December, 1982 the Price Landfill site was placed on the National Priorities List (NPL) by the United States Environmental Protection Agency (USEPA). Of 97 New Jersey sites on the NPL, this site ranks third.

Monitoring data indicates considerable ground water contamination exists in the vicinity of Price Landfill. Among the contaminants present are benzene, cadmium, chloroform, dichloroethylene, lead, 1-2-transdichloroethylene, trichloroethylene, vinyl chloride and acetone. The ground water flow in the area of the landfill is complex, with three separate aquifer formations located within 150 feet from the surface. The plume of contamination extends almost one mile from the site and the contaminants tend to move in an east-northeast direction.

In December, 1981, USEPA commissioned a contractor, Camp, Dresser and McKee (CDM), to prepare a two-part study addressing: 1) the immediate measures necessary to ensure a supply of uncontaminated water to affected communities for the summer of 1982 and 2) the long-term remedial solutions necessary to protect the water supply and to remediate the discharge of contaminants from the landfill.

During April, 1982, CDM issued a report outlining initial measures necessary to ensure the summer water supply: upgrading of the water treatment plant, the redevelopment of three production wells, installation of a water supply system interconnection, provision of standby carbon filter units and implementation of water conservation measures and a ground water monitoring program. These measures were successfully implemented.

In June, 1983, CDM issued a second report summarizing its full investigative study. This included development of computer ground water flow models designed to assess the movement of contaminants leaching from the landfill and an evaluation of ten remedial alternatives. This study led to a decision to relocate the Atlantic City Municipal Utilities Authority (ACMUA) wells. From the ten remedial alternatives outlined in the study, four were selected for further investigation and the computer models were recalibrated to 1984 field conditions to predict the behavior of each of these alternative courses of action. These four alternatives were studied in depth during a subsequent remedial investigation and feasibility

over...

In each case, the exact configuration of the extraction wellfields, including the number of wells, the individual well pumping rates and the specific locations, both horizontally and vertically within the aquifer system, are subjects to be addressed by the engineering design of the selected alternative.

Copies of CDM's final report are available for public review at the following locations:

1. Office of the Mayor
   Egg Harbor Township Municipal Building
   262 Bargaintown Road
   Linwood, NJ 08221

2. Office of the City Clerk
   18 North First Street
   Pleasantville City, NJ 08232

3. Office of the City Clerk
   City Hall
   Absecon, NJ 08201

4. Atlantic City Public Library
   1 North Tennessee Avenue
   Atlantic City, NJ 08401

The New Jersey Department of Environmental Protection (NJDEP) and USEPA are recommending implementation of Alternative 2. A public meeting to discuss this report will be held in July and followed by a 21-day comment period during which comments on the report will be received by NJDEP. They should be addressed to:

Grace L. Singer, Chief
Office of Community Relations
Division of Hazardous Site Mitigation
New Jersey Department of Environmental Protection
432 East State Street
Trenton, NJ 08625

For further information contact Susan Gall, Office of Community Relations, Division of Hazardous Site Mitigation, at (609) 633-2320.

6/86
NJDEP

Glossary of Terms

Administrative Consent Order (ACO): A binding legal document between a government agency and a responsible party. It is issued by the government in the form of an order that specifies site mitigation activities to be undertaken by the responsible party.

Contract: The legal agreement that outlines federal and state government responsibilities at USEPA-lead sites on the National Priorities List (Superfund sites) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Cooperative Agreement: An agreement whereby USEPA transfers funds and other resources to a state for the accomplishment of certain remedial activities at sites on the National Priorities List (Superfund sites) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Engineering Design (Remedial Design): Following a feasibility study, an engineering design is executed to translate the selected remedy in accordance with engineering criteria in a bid package, enabling implementation of the site remedy.

Focused Feasibility Study (FFS): A limited feasibility study which is performed on a certain aspect of site remediation and/or when more than one remedial measure is considered technically viable for the immediate control of a threat

Immediate Removal Actions (IRAs): Actions taken to prevent or mitigate immediate and significant risk to human life, health or to the environment.

Initial Remedial Measures (IRMs): Actions that can be taken quickly to limit exposure or threat of exposure to a significant health or environmental hazard at sites where planning for remedial actions is underway.

Monitoring Well: A well installed under strict design specifications that, when sampled, will reveal hydrogelogic data at its point of installation. Monitoring wells are installed at predetermined locations, usually in groups, to gain knowledge of site conditions including: extent and type of ground water contamination, soil types, depth to ground water and direction of ground water flow.

National Contingency Plan (NCP): The basic policy directive for federal response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). It sets forth the Hazard Ranking System and procedures and standards for responding to releases of hazardous substances, pollutants, and contaminants. The NCP is a regulation subject to regular revision.

National Priorities List (NPL): A list of the highest priority releases or potential releases of hazardous substances, based upon

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WASTE MANAGEMENT

HAZARDOUS SITE MITIGATION ADMINISTRATION

A Community Relations Program at Superfund Hazardous Waste Sites

As part of the federal/state program of cleanup at hazardous waste sites, a Community Relations Program is conducted to receive local input and to advise local residents and officials about the planned remedial actions at the three major stages of the cleanup: 1) remedial investigation/feasibility study 2) engineering design and 3) removal/treatment/construction. Local briefings and meetings are conducted with elected officials and residents and generally take place at:

1) The commencement of a remedial investigation/feasibility study so that local concerns can be addressed early in the process.

2) The completion of a feasibility study to discuss the alternative courses of remedial action. There is a 30-day comment period after public presentation of the alternatives during which the feasibility study is available in local repositories.

3) The engineering design stage to carry out the mandates of the selected remedial alternative.

4) The commencement of the removal/treatment/construction stage to advise of the expected physical remedial action.

5) The completion of the remedial action.

In addition to the activities outlined above, there is generally ongoing communication with local officials and residents as required. Depending upon whether the New Jersey Department of Environmental Protection (DEP) or the United States Environmental Protection Agency (EPA) has the lead in remedial action at a site, community relations activities are conducted by the relevant State or Federal agency.

In New Jersey, the DEP Community Relations Program is directed by Grace Singer, Chief, Office of Community Relations (609) 984-3081. At Region II, EPA, the contact person is Lillian Johnson, Community Relations Coordinator (212) 264-2515.

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting to Discuss
Completion of the
Remedial Investigation/Feasibility Study
for the Price Landfill Site

Tuesday, July 15, 1985
7:00 p.m.
Egg Harbor Township
Municipal Building
262 Bargaintown Road
Linwood, New Jersey

PLEASE PRINT

NAME AFFILIATION ADDRESS

1. John Callahan EHT RESIDENT 13 ORCHARD RD. BARGAINTOWN
2. Odissa Quarterman Cedar St
3. Khristena Graham Hickory St
4. RICK DOVER 1333 Atlantic Ave, Atl City
5. [illegible] Egg Harb
6. Jeffrey E Qumola Box 881 Cedar ABSECON
7. Lamont [illegible] Box [illegible] Absecon
8. Theresa Stevens Resident Box 536 Asbury Ave E.H.T.
9. Cathy White EHT Box 516 Asbury Ave
10. Jane Thomas 511 W. Calif Absecon
11. Martha Seibert TV 40 Dennis Richardson

[illegible] Marrett [illegible] Dr. Campbell

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NAME AFFILIATION ADDRESS

13. William [illegible]
14. Robert Anderson Twp Egg Harbor, Mun Bldg
15. BC CARLAN KYW-TV PHILA
16. [illegible] Bargantown. Planning Board
17. George Fluke Northfield NJ
18. Gloria White Farmington
19. Louis Gallodd 116 Mooreshore Absecon
20. Olivia Dorsey Farmington N.J.
21. Dealia White 731 W. Calif ave
22. Greg Woodson Farmington 22-D Cedar St
23. Juanita Mincey Bx 154 Jellian Rd Farmingt
24. Tim Kaye 12 E Walnut St. Pville
25. Juanita Corez 731 W. Calif Ave Abs NJ
26.
27.
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29.

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

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NAME AFFILIATION ADDRESS

1. [illegible] 69-73 [illegible]
2. ROBERT McKNIGHT U S EPA NEW YORK
3. [illegible]
4. [illegible] 154 [illegible]
5. LORI WOODSON BOX 13-D ABSECON NJ 08201
6. William J. [illegible] " " " "
7. [illegible]
8. [illegible] EHT Resident Box 118K, RD#6 Ocean Heights
9. Bill Ritchie RESIDENT IN Dump Vicinity ATLANTIC & SECOND AVES FARMINGTON N.J.
10. Jeffrey P. Heppard Parker, McCay & Criscuolo Marlton, NJ
11. Sal Boccamento USEPA

[illegible]

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

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262 Bargaintown Road
Linwood, New Jersey

PLEASE PRINT

NAME AFFILIATION ADDRESS

1. [illegible] 1333 [illegible] Ave [illegible] NJ.
2. Martha Woodson Box 55-D. Cedar St Cologne 0820
3. Joseph [illegible] RD 3 Box 134 Atlantic ave 0823
4. [illegible] RD 3 [illegible] Farmington
5. BRIAN [illegible] 1333 [illegible] ([illegible])
6. JACK C [illegible] 1049 [illegible] DR. TOMS RIVER
7. Dave M[illegible] [illegible] NJ
8. Julie Pszczolkowski Township Clerk's Office
9. Mrs William Ritchie Atlantic Ave, Farmington
10. Kristine C. Neill Park Ave [illegible]
11. Jim [illegible] 1333 Atlantic Avenue A. C.

[illegible] 158 R-3-Box 74. W.C.A ave

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NAME AFFILIATION ADDRESS

13. Gene Doelly EHTMUA Town Hall

14. Sandra W. Beerbower EHT Environment Comm

15. Mayor EHT

16. Bob Filipczak 2001 Shore Rd Linwood

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